



**NetMark  
Baseline Survey  
on  
Insecticide  
Treated Materials  
(ITMs)  
in Senegal**

**May 2001**



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## **LIST OF ACRONYMS**

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<b>AED</b>	<b>Academy for Educational Development</b>
<b>ITMs</b>	<b>Insecticide treated materials</b>
<b>ITNs</b>	<b>Insecticide treated nets</b>
<b>RI</b>	<b>Research International</b>
<b>SES</b>	<b>Socio-economic status</b>
<b>UNICEF</b>	<b>United Nations' Children's Fund</b>
<b>USAID</b>	<b>United States Agency for International Development</b>
<b>USD</b>	<b>U.S. Dollars</b>
<b>WHO</b>	<b>World Health Organization</b>
<b>WRA</b>	<b>Women of reproductive age</b>
<b>XAF</b>	<b>CFA Franc</b>

## MAP OF SENEGAL

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## EXECUTIVE SUMMARY

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- PURPOSE:** Provide baseline measures of
- Knowledge and beliefs about mosquitoes and malaria
  - Beliefs and attitudes about use of treated and untreated mosquito nets
  - Access, affordability, and ownership of mosquito nets
  - Net treatment practices
  - Use of nets and treated nets by vulnerable groups: children under five, pregnant women, and women of reproductive age
  - Consumer preferences regarding mosquito nets
  - Usage and attitudes regarding mosquito control products

**METHODOLOGY:** Survey

**SAMPLE:** 1000 Senegalese households from 5 sites: Dakar, Thies, St. Louis, Kaolack, and Tambacounda. Target sample in each site was 200: 80 respondents from urban households, 60 from households within 100km, and 60 from households 100-200 km from the urban center. Respondents were women aged 15-49 who were mothers/guardians of children under five years of age.

**DATA COLLECTION:** October 2000

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### STUDY FINDINGS:

#### Knowledge and beliefs about malaria and mosquitoes

Recognition of the French term for malaria—"paludisme" (or "palu" for short)—was very high. Knowledge of symptoms and vulnerable groups was very good. Knowledge about causes was somewhat low. Exposure to information about malaria prevention appears high.

- The great majority of respondents (86%) reported having heard of "paludisme"/ "palu". Although the vast majority knew that mosquitoes cause malaria (88%), only 28% knew that mosquitoes are the *only* cause of malaria. The majority (89%) mentioned fever as a symptom; many mentioned other symptoms that are also manifestations of malaria. Few (4%), however, mentioned convulsions, a symptom of severe malaria. Most (86%) knew that children under five and pregnant women are most susceptible to severe malaria.
- Most (91%) respondents who had heard of "paludisme"/ "palu" said they had received information about avoiding the disease in the past 12 months. However, 5% had heard information only from non-professional sources (friends, neighbors, or relatives), rather than from more professional and presumably more reliable sources. There is a considerable amount of information transmitted via mass media—69% had heard something on the radio and 52% had seen something on TV—as well as via health staff (36%) and/or health facility posters (14%).

#### Perceived advantages and disadvantages of net use

Levels of perceived advantages of net use by vulnerable groups—children under five and pregnant women—were very high, while levels of perceived disadvantages were low. Nets were seen as providing good protection against

mosquitoes and malaria and helping children sleep better. *Treated* nets were seen as especially effective, with the added advantage of killing and repelling mosquitoes. The small portion of respondents citing disadvantages of a child sleeping under a net were concerned about suffocation, heat or entrapment. Respondents cited stronger disadvantages of *treated* nets, voicing concerns about the safety of the chemical and its smell.

- Virtually all respondents (99%) perceived advantages for a child under five sleeping under a mosquito net. Most commonly mentioned advantages were “avoid getting bitten by mosquitoes” (89%), “don’t get bothered by other insects/pests” (46%), “don’t get malaria” (40%), and “sleep better” (39%).
- The vast majority of respondents (85%) did not cite any disadvantages to a child under five sleeping under a mosquito net. The most commonly mentioned disadvantages were “child might get caught/trapped” (5%), “child may suffocate” (3%), and “it is hot sleeping under a net” (3%).
- Almost all respondents (89%) perceived advantages for a child under five sleeping under a *treated* net. The most commonly mentioned advantages were “kills mosquitoes” (42%), “repels mosquitoes away from net” (42%), and “works better against mosquitoes than an untreated net” (33%).
- About three-fourths (76%) did not cite any disadvantages for a child under five sleeping under a *treated* net. The most commonly mentioned disadvantages were that the chemical is dangerous (11%) and that smell of the chemical is bad (10%).
- The vast majority of respondents (85%) perceived advantages for a pregnant woman sleeping under a *treated* net. The most commonly mentioned were “repels mosquitoes away from the net” (37%), “kills mosquitoes” (35%), that the “pregnant woman is more protected” (30%), and that it “works better against mosquitoes than a net that has not been treated” (25%).
- About three-fourths (73%) did not cite any disadvantages for a pregnant woman sleeping under a *treated* net. The most commonly mentioned disadvantages were that the smell of the chemical is bad (13%) and that the chemical is dangerous (12%).

### **Access to mosquito nets**

Nets were available through commercial and non-commercial outlets, with markets being reported as the most accessible. There was great range in the amount of time/distance necessary to travel to find a net. Some consumers reported that nets are not available or they did not know where to get them.

- About half (52%) of respondents reported that the market was the nearest place where they could buy mosquito nets; 21% named a non-commercial source. Most (47%) would get there on foot and take an average of 13 minutes, or travel by bus (33%) and take an average of 40 minutes.
- Ten percent (10%) said that nets were not available or that they did not know where to get them.

### **Mosquito net ownership, treatment, and use**

Net ownership in the study sites was moderately high and nets were not used year-round. Nets had been obtained from both commercial and non-commercial sources. Non-owners said that the main reason they did not own a net was cost. Some viewed nets as unnecessary and others said that nets were not available or they did not know where to get them. Awareness of treatment of nets with insecticide was high although relatively few people treated their nets. Those who did tended to get the treatment from a public source. Pregnant women and children under five were more likely than other family members to sleep under a net.

- One-third (34%) of households reported owning one or more mosquito nets. Over half (52%) of net-owning households owned more than one mosquito net. Net ownership was lowest in the Dakar site (18%). Households of lower socio-economic status (SES) were somewhat more likely than households of higher socio-economic status to own a net.
- Most (70%) households had heard of treating mosquito nets with insecticide solution and 11% of households owned a treated mosquito net. Thirty percent (30%) of nets were treated: 18% had been pretreated when purchased and 15% were treated/re-treated after purchase. Households from higher SES segments were more likely to be aware of net treatments and to have treated a net than those from lower SES segments. On average, nets had been treated/re-treated 2.7 times since purchase, were last treated 5.6 months ago and were washed 3 times since last treatment.
- Treatments were obtained mostly from non-commercial sources such as clinics (49%) or hygiene services (22%), and most consumers (91%) did not know what product was used to treat the net.
- About half (53%) of children under five in net-owning households slept under a net the prior night, representing 18% of all children under five in the households in the sample. Only 17% of these children slept under a *treated* net the prior night, representing 6% of all children under five in the households in the sample. The proportion of net-owning households where all children under five slept under a net the prior night decreased the more children the household had.
- Almost half (49%) of women of reproductive age (WRA) in net-owning households slept under a net the prior night, representing 17% of the total number of women of reproductive age in the households in the sample. Only 9% of WRA slept under a *treated* net the prior night, representing 5% of WRA in the households in the sample. Sixty percent (60%) of pregnant women in net-owning households slept under a net the prior night, representing 21% of pregnant women in the households in the total sample. Only 17% in net-owning households slept under a *treated* net the prior night, representing 6% of all pregnant women in the sample households. (The denominators for pregnant women, however, were very small.)
- For those household members who did sleep under mosquito nets, the average number of months per year they slept under nets was 6.
- Two or three people usually slept under a large net.
- Half (50%) of non-net owners said they did not own a net because they don't have enough money. Almost one fourth (24%) reported that they do not need them. Ten percent (10%) said that nets were not available or that they did not know where to get them.

### Characteristics of nets owned

About half of all nets were purchased in a market. The average price of a net was 5.32 USD. Almost half had been acquired within the past two years. Almost all were rectangular, and most were either king or double-sized. Tailor-made (non-manufactured nets) were common. Nets are commonly unbranded products; consumers were unaware of the brand. Half the nets were reportedly washed at least once a month.

- About half (51%) of the nets owned were purchased in a market. Twelve percent (12%) were received as a gift. A higher percentage of nets in lower SES households were purchased from an informal commercial source (e.g., open air market) than those from higher SES households. Forty-five percent (45%) of nets had been acquired within the past 2 years and 19% were acquired 5 or more years ago.
- Households reported paying an average of 5.32 USD per net (conversion based on the exchange rate for the dollar on the date of the data collection).
- Almost one-fifth (19%) of nets owned by households were tailor-made (non-manufactured nets). Owners of manufactured nets were generally unaware of the brand.

- The most common net sizes owned were king (44%) and double (43%). The most common shape was rectangular (88%).
- About three-fourths (74%) of nets had been washed. Half (50%) were reportedly washed at least once a month, with 15% of nets being washed weekly.

### **Consumer mosquito net preferences**

Households generally preferred round/conical, king sized nets. They liked a variety of colors.

- Over half of all respondents (54%) preferred round/conical nets and 38% preferred rectangular nets. Preferred net sizes were king (80%) and double (12%).
- Twenty-nine percent (29%) of respondents preferred white mosquito nets; 19% dark blue; 18% pink; and 17% light blue. Thirty six percent (36%) disliked black nets; 19% dark green; 17% white; 14% dark blue; 10% pink; and 9% light green.

### **Awareness, use, and price of mosquito control products**

Mosquito nets, coils, and aerosol insecticides were the mosquito control products that consumers were most aware of. Those most frequently used were coils and insecticides. Consumers tended to purchase these products frequently, mostly from general shops.

- Awareness (unprompted) of mosquito control products was highest for mosquito nets (85%), mosquito coils (85%), and aerosol insecticides (80%). The most frequently used products were coils (61%) and aerosol insecticides (54%). (These use figures may be low, given that “use” was asked only of those who indicated unprompted that they were aware of a given product.) Use of aerosols was higher in urban areas whereas use of coils and nets was higher in rural areas.
- The average reported prices were \$1.37 for 180-220 ml can of aerosol insecticide and \$1.85 for a 300-350 ml can; single mosquito coils averaged \$0.07. Nearly three-fourths (72%) of households that had purchased mosquito coils in the 12 months prior to the interview did so within the last 7 days. Three-fourths (75%) of households purchased aerosols within the last month or less. Aerosols were purchased mostly in general shops (71%), as were coils (93%).

### **Perceptions of mosquito control attributes, products, and brands**

The most highly valued attributes that consumers wanted in an insect control product were that it kills mosquitoes and other insects and reduces malaria. Of all insect control products, nets were rated most highly among consumers on most attributes. Insecticides were rated most highly on killing mosquitoes and other insects and being an effective brand. Consumers were most aware of Yotox, Baygon, and Elf brands and associated them most with the attributes of insect control products they value.

- On a scale of 1-7, respondents said that the most important attributes of mosquito control products were “kills mosquitoes” (6.76), “kills other insects, other than mosquitoes” (6.57), “reduces malaria” (6.51), “is safe to use around children (6.28), and “is a long-term solution to mosquito problems” (6.19).
- Respondents rated mosquito nets more highly than all other insect control products on the majority of insect control product attributes including, is safe to use around children (89%), reduces malaria (83%), is a long-term solution to mosquito problems (78%), keeps mosquitoes away while sleeping (71%), and is a good value for the money (64%). Sprays/aerosols were considered to be the best products to kill mosquitoes (92%), to kill other

insects other than mosquitoes (91%), and to rate higher than the other insect control products on “is a high quality/effective brand” (60%).

- Brand awareness was highest for Yotox (93%), Baygon (77%), and Elf (66%). Yotox, Baygon, and Elf were most associated with the insect control attributes consumers value.

#### **PROGRAM/PRODUCT IMPLICATIONS:**

The overall setting for ITM promotion and sales in Senegal is favorable, with a few negative perceptions of net treatments (but not nets) to be overcome.

Favorable factors include:

- high awareness of malaria and general understanding of how it is transmitted;
- common use and relatively frequent purchase of mosquito control products;
- high awareness of mosquito nets as an insect control method and highly favorable attitudes toward mosquito nets compared to other insect control products;
- a net culture that is already being established (moderate level of net ownership and recent acquisition of nets); already moderate level of ITM awareness in many areas;
- strong valuing of the product attributes that ITMs deliver;
- and very high level of perceived advantages of net use by vulnerable groups and low level of perceived disadvantages.

Main barriers to overcome for ITM promotion are:

- perceived high cost of nets;
- limited access to nets;
- lack of variety in net size, shape, and color;
- concerns regarding the safety and potential adverse health effects of treated nets, particularly with regard to young children and pregnant women;
- marginal availability of insecticide treatments through commercial sector;
- lack of strong branding of nets and insecticide treatments;
- low levels of ITM awareness in some areas; inadequate net treatment practices, including lack of regular treatment and re-treatment of nets;
- inadequate use of ITMs by young children and pregnant women;
- moderate exposure to malaria prevention messages; and
- misperceptions about the causes of malaria.

# SECTION 1

## INTRODUCTION

---

### 1.1 BACKGROUND

#### The Problem of Malaria

Malaria is a growing health problem in Africa. Each year, 300-500 million people worldwide suffer from the disease, with 9 out of 10 cases occurring in sub-Saharan Africa (WHO, 1998). Malaria kills at least 1 million people each year and the vast majority of deaths occur among children less than five years of age. In Africa, one out of twenty children is likely to die of a malaria-related illness before his fifth birthday (WHO, 1999). Pregnant women are also particularly susceptible to the disease. Malaria during pregnancy causes severe anemia, miscarriages, stillbirths, and maternal deaths, and may account for up to 40% of preventable low birth weight among newborns in endemic areas (Brabin, 1991; UNICEF, 1999). Malaria places a staggering economic burden on already strained national economies and on struggling families. The disease cost sub-Saharan African nations more than 2 billion USD in 1997 (WHO, 1998) and has slowed economic growth in Africa by up to 1.3% each year (Gallup & Sachs, 2000). In addition, malaria reduces human work capacity and productivity, and affects social development indicators such as child health and school attendance (Global Forum for Health Research, 2000).

Consistent use of mosquito nets and curtains that have been treated with insecticide—insecticide treated materials, or ITMs—has been proven effective in reducing malaria. Current data indicate that ITM use can prevent 19% of child deaths from all causes, with some country-specific studies in Africa suggesting that as much as 42% of all-cause mortality among children under-five can be averted. Additionally, malaria morbidity in children under five has been shown to decrease by as much as 21-72% when ITMs are used (Lengeler, 1998).

To date, however, few families in Africa have mosquito nets and there has been little consumer marketing and distribution of ITMs in most African countries. Where they have been marketed (e.g., Tanzania and The Gambia), their supply has been limited and often donor-organized and subsidized. Currently, many households use other anti-mosquito measures such as coils and aerosol sprays to prevent nuisance biting, but the efficacy of these products in preventing malaria remains unknown.

#### NetMark

NetMark is a United States Agency for International Development (USAID)-funded effort to promote the use of ITMs to prevent malaria in sub-Saharan Africa through the formation of public-private partnerships. Managed and carried out by the Academy for Educational Development (AED), the NetMark partnership includes, in addition to AED, the U.S. government, The Malaria Consortium of the London School of Hygiene and Tropical Medicine & the Liverpool School of Tropical Medicine, The Johns Hopkins School of Hygiene and Public Health, and Group Africa. The primary goal of NetMark is to develop a sustainable market for ITMs, especially mosquito nets (bednets), in target countries in Africa. The main objectives of the project are to increase the proportion of households that own ITMs, increase nightly use of treated nets, especially by those most vulnerable to malaria (pregnant women and children under five years of age); and increase the proportion of net owners who regularly re-treat their nets with insecticide.

## 1.2 SURVEY OBJECTIVES, SAMPLE, AND IMPLEMENTATION

### Objectives

As part of a comprehensive research agenda that includes both market and behavioral research, NetMark conducted a household survey in Nigeria, Zambia, Uganda, Senegal, and Mozambique to serve as an evaluation baseline. The baseline survey was to provide quantitative information useful to the public health community as well as to the private sector. Specifically, the objectives of the survey were to provide data on:

- Knowledge and beliefs about mosquitoes and malaria
- Beliefs and attitudes about use of treated and untreated mosquito nets
- Access, affordability, and ownership of mosquito nets
- Net treatment practices
- Use of nets and treated nets by vulnerable groups: children under five, pregnant women, and women of reproductive age
- Consumer preferences regarding mosquito nets
- Usage and attitudes regarding other mosquito control products

In addition, the baseline survey information will supplement the NetMark qualitative research findings to inform the development of insecticide and net products and to design regional promotional campaigns encouraging the purchase and correct use of these products.

The same instrument was used in each of the five countries in order to ensure comparability of data. This document reports on findings from Senegal. Reports on the other four countries are available from NetMark.

### Sample

This survey was conducted among 1000 households in Senegal with women aged 15-49 who were mothers or guardians of children under five years of age. The sample was drawn from 5 sites: Dakar, Thies, St. Louis, Kaolack, and Tambacounda. The target sample in each site was 200: 80 respondents from the urban center, 60 from rural households within 100 kilometers from the urban center and 60 from households 100-200 kilometers from the urban center. The actual sample distribution attained is shown in Table 1.

Table 1: Distribution of sample among sites

Site	Total	Urban	Rural 100 km from Urban	Rural 200 km from Urban
Dakar	205	85	60	60
Thies	199	80	60	59
St. Louis	201	80	60	61
Kaolack	198	79	60	59
Tambacounda	197	76	61	60
<b>TOTAL</b>	<b>1000</b>	<b>400</b>	<b>301</b>	<b>299</b>

A multistage sampling procedure was used to select the respondents participating in the survey, as follows:

*1- Selection of primary sampling units:* Purposive sampling was used to select five sites across the country that reflected the geo-ethnic diversity of the population. However, the Casamance region was deliberately excluded from the study because of insecurity in the area. (See Table 2.)

*2- Selection of sampling points:* Within each of the five sites, 20 sampling points (villages or urban neighborhoods) were randomly selected from electoral lists using quota sampling: 8 from within the city (“urban”); 6 from within 100 kilometer radius from the city (“near rural”); and 6 from within a 100-200 kilometer radius from the city (“far

rural”). This stratification scheme was designed to meet the purposes of the evaluation. Since a key objective of NetMark is to increase access to ITMs across the socio-economic spectrum, it was essential to include urban centers with the potential to be reached by product distribution systems, as well as include households located at varying distances from the urban center.

*3- Selection of households:* Ten interviews were conducted per sampling point, each in a different household. For each sampling point, a starting point (a fixed landmark or address) and the direction from which to start the data collection were chosen. Interviewers were instructed to go to the starting point and walk in the chosen direction until they located a residence with a qualified respondent. After a successful interview, interviewers were instructed to skip five residences (or less if residences were far apart) and seek another qualified respondent.

*4- Selection of eligible respondents:* An eligible respondent for the evaluation was a female 15-49 years old who was the parent or guardian of a child under five years old, i.e., aged 0-4. Females aged 15-49 were selected to maximize the sample size for calculating the proportion of females of reproductive age sleeping under a net. Similarly, only those women who had a child under five were included, to maximize the sample size for calculating the proportion of children under five sleeping under a net.

This sampling procedure was designed to meet the purposes of this study. In the interest of cross-national comparability, the procedure was standardized across all five countries surveyed. In Senegal, the sampling strategy resulted in an urban-rural breakdown that approximates the national proportions: this sample is 40% urban and 60% rural, and data from World Urbanization Prospects (United Nations, 1994) found that Senegal was 42% urban and 58% rural.

In other ways, however, the sampling procedure devised for this study may have resulted in a sample that differs from a true national random sample (which was neither desirable nor feasible in this case):

- a) Net promotion activities in or near the study sites may have resulted in net ownership rates that are higher than those that would have been obtained by a true national random sample. Two sites, Kaolack and St. Louis, were purposively chosen because they are the site of ITM projects. UNICEF and Plan International are operating in Kaolack, and World Vision and The European Development Fund (Luxembourg) are operating in St. Louis. ITM promotion has received increasing attention in many African countries, and these sites were included to reflect this situation and to enable internal comparison among sites.
- b) Only households with children under five were included in the sample, and the extent to which these households differ from other households with respect to the variables measured is not known.
- c) Only women of reproductive age were selected as respondents. Responses from men or from older women may differ from those of the women in the sample.

Table 2: Study sites, location and main ethnic/language groups

Site	Province/District	Ethnic Group/Language
Dakar	Dakar	Multi-ethnic French
Thies	Thies	Wolof, Sérères, Pulaar
St. Louis	St. Louis	Toucouleur, Peuhl, Wolof
Kaolack	Kaolack	Wolof, Sérères
Tambacounda	Tambacounda	Multi-ethnic

## Implementation

The research was carried out by NetMark and the Africa offices of Research International (RI). NetMark staff developed the survey instrument (survey) based on project qualitative research and a review of existing instruments on ITMs; subsequently, the draft was reviewed by colleagues from RI as well as from collaborating institutions and countries. NetMark and RI jointly conducted nearly a week of instrument pre-testing in Zambia in September 2000. In October, RI trained local Senegalese data collectors, and thereafter managed the implementation of the survey. The data were collected during October 2000.

To maximize comparability of data, the surveys were administered in all five countries (Nigeria, Senegal, Zambia, Uganda, and Mozambique) more or less simultaneously, during October and November of the year 2000. It should be noted, however, that the timing of the rainy season differs by country, and is likely to affect net use patterns. In Senegal, the timing of the study meant that the data were collected during the end of the rainy season.

### 1.3 ORGANIZATION OF THE REPORT AND TABLES

After describing the sample, this report presents findings grouped into three main areas: (1) knowledge and beliefs about mosquitoes and malaria; (2) mosquito nets; (3) and other mosquito control products. Implications of the findings are discussed in the final section.

This report attempts to present a large amount of data in a standard and accessible way. It includes a complete set of tables to serve as a data resource, and each table is accompanied by statements summarizing the main results. Each of the five country reports contains the same set of tables, for purposes of comparability.

In most of the tables in this report, data are broken down in several ways:

- By **site**: the five primary sampling areas (i.e. Dakar, Thies, St. Louis, Kaolack, Tambacounda), each of which includes both urban and rural areas
- By **location**: a refined urban-rural breakdown, which distinguishes between respondents in Dakar proper, those in the four other urban centers, those living in “near rural” areas (within 100 km from the urban center) and those living in “far rural” areas (100-200 km from the urban center).
- By **urban-rural**: urban and rural respondents across sites compared with all rural (both “near rural” and “far rural”) respondents across sites.

Some variables are also broken down by socio-economic status (SES). A description of the variables in the SES scale and of the procedure used to develop the scale is found in Section 2, which follows.

Results are presented in percentages, unless otherwise stated. Each table indicates whether percentages are based on the entire sample or on a sub-group. Base figures (denominators) are given as absolute numbers.

## SECTION 2

### CHARACTERISTICS OF RESPONDENTS

This section provides descriptive information on respondents and households in the sample. It also provides information on socio-economic status (SES) variables, which were combined to create a five-point SES scale.

The scale was calculated as follows: Categorical variables were re-coded to become pseudo-ordinal variables, and categories that were judged to be equivalent in terms of SES were combined to increase the frequency of responses. Principal component analysis was used to extract the main, single factor that accounted for the largest amount of variance in the data. Using the factor scores from the principal component analysis, respondents were divided into 10 groups based on the deciles of the factor scores. To assure adequate cell sizes, these ten groups were collapsed into a five point scale, so that each SES level has approximately 20% of the sample in it. In this scale, "1" indicates the lowest SES group and "5" indicates the highest.

#### 2.1 CHARACTERISTICS OF RESPONDENTS

Table 3: Characteristics of respondents  
Among all respondents

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
<b>Age of Respondent</b>												
15-19	6.2	8.3	4.5	2.5	6.6	9.1	12.9	2.9	6	8	5	7
20-29	41.6	41.5	43.7	43.3	39.9	39.6	40	39.4	42.9	43.1	39.5	43
30-39	35	29.3	38.7	39.3	33.8	34	25.9	41	35.5	30.8	37.8	33.2
40-49	17.1	21	13.1	14.9	19.7	16.8	21.2	16.5	15.6	18.1	17.5	16.8
<b>Education Level of Respondent (yrs)</b>												
0	46.9	40	51.8	42.8	43.4	56.9	29.4	32.1	53.2	61.2	31.5	57.2
1-5	11.2	8.3	8	12.4	14.1	13.2	5.9	11.7	12.6	10.7	10.5	11.7
6-12	37	45.4	34.7	38.3	36.9	29.4	54.1	51.7	30.2	23.4	52.3	26.8
13+	3.6	6.3	4	5	2	0.5	10.6	3.8	2.7	2.3	5.3	2.5
Mean (among those w/schooling)	7.21	8.06	7.44	7.43	6.49	6.32	9.32	7.32	6.67	6.5	7.76	6.59
<b>Language of Interview</b>												
French	5.7	9.3	3.5	5	3.5	7.1	15.3	6.3	2.7	5.4	8.3	4
Wolof	94.3	90.7	96.5	95	96.5	92.9	84.7	93.7	97.3	94.6	91.8	96

## 2.2 CHARACTERISTICS OF HOUSEHOLDS

Table 4: Household composition

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
Number of household members per household (mean)	7.77	7.43	7.87	7.86	8.02	7.68	6.66	7.37	8.09	8.19	7.22	8.14
Number of women of reproductive age in household per household (mean)	1.94	2	1.93	2.04	2	1.71	2.05	1.93	1.97	1.88	1.96	1.92
Number of children under age 5 per household (mean)	2.12	1.88	2.37	1.89	2.33	2.14	1.64	1.9	2.23	2.37	1.85	2.3

Table 5: Age distribution of household members

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	7770	1524	1567	1579	1588	1512	566	2321	2435	2448	2887	4883
0	4.1	3.9	5	4.2	3.7	3.6	3	4.1	4.4	4	3.9	4.2
1	3.6	3.4	3.4	3	3.8	4.4	4.4	2.9	3.7	4	3.2	3.9
2	5.2	5.4	5.7	4.5	5.7	4.7	6.7	5.1	5.2	5	5.4	5.1
3	5.3	4.9	5.9	4.3	6.7	4.6	3.9	5.3	5.4	5.6	5	5.5
4	5.1	4.9	5.2	4.9	4.7	5.6	4.9	5	4.6	5.6	5	5.1
5-14	29.5	28.1	26.5	29.3	29.7	34.3	24.2	27.4	31.8	30.4	26.8	31.1
15-49	38.6	41.2	38.9	40.5	36.2	36.2	44.7	41.2	36.7	36.6	41.9	36.7
50+	8.6	8.1	9.5	9.1	9.6	6.5	8.1	9	8.3	8.6	8.8	8.4

## 2.3 SOCIO-ECONOMIC DESCRIPTORS

Table 6: SES indicators

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
<b>Employment of main wage earner</b>												
Regular	39	46.3	41.7	38.3	38.4	29.9	54.1	51.4	34.2	26.4	52	30.3
Seasonal	48.2	42.9	47.2	53.7	44.4	52.8	37.6	41	52.8	54.2	40.3	53.5
Casual	10.8	8.3	10.6	6.5	14.6	14.2	5.9	6.3	10	17.7	6.3	13.8
<b>Main wage earner's years of schooling</b>												
0	46.9	37.1	54.8	42.3	49.5	51.3	25.9	36.8	51.8	58.5	34.5	55.2
1-5	2.9	2.4	2	5.5	2	2.5	3.5	2.5	2.7	3.3	2.8	3
6-12	16.4	16.1	20.6	15.4	13.1	16.8	15.3	22.2	14	13	20.8	13.5
13+	10.3	12.7	10.1	12.9	10.1	5.6	16.5	16.2	6.6	6	16.3	6.3
Don't Know	23.5	31.7	12.6	23.9	25.3	23.9	38.8	22.2	24.9	19.1	25.8	22
<b>Household items</b>												
Electricity	62.7	85.4	67.8	59.2	55.1	45.2	97.6	85.1	56.5	35.5	87.8	46
A radio	80.9	90.7	87.4	91.5	78.8	55.3	96.5	87	80.4	70.6	89	75.5
A television	52.3	69.3	55.3	56.7	42.9	36.5	87.1	71.4	45.5	29.1	74.8	37.3
A telephone/Cell phone	24.1	37.6	26.1	25.4	18.7	12.2	60	39.4	16.9	5	43.8	11
A refrigerator	29.7	42.9	26.1	30.3	24.7	23.9	65.9	45.7	19.9	12.4	50	16.2
A bicycle	11.1	8.8	3.5	4	6.6	33	14.1	14.6	10	7.7	14.5	8.8
A motorcycle	6.9	5.9	2	6	3	17.8	10.6	11.1	4.7	3.7	11	4.2
A car or truck	13	19.5	8	14.9	10.1	12.2	36.5	16.2	11.3	4.7	20.5	8
An animal-drawn plough	9	2	6	2.5	7.1	27.9	2.4	1.3	9.3	18.7	1.5	14
Windows with mosquito screens	12.5	17.1	9	18.4	11.1	6.6	28.2	21	6	5.7	22.5	5.8
<b>Energy source for cooking</b>												
Electricity	0.8	1.5	0.5	1	1	0	3.5	1.3	0.3	0	1.8	0.2
LPG/natural gas	49.3	79.5	63.3	47.8	49	5.6	76.5	63.2	48.2	28.1	66	38.2
Biogas	0.2	0.5	0	0	0.5	0	1.2	0	0.3	0	0.3	0.2
Kerosene/Paraffin	0.1	0	0.5	0	0	0	0	0	0	0.3	0	0.2
Coal/lignite	0.7	0	0.5	1	0	2	0	1	1	0.3	0.8	0.7
Charcoal	20.6	14.1	11.6	22.4	16.7	38.6	18.8	27.6	15.3	19.1	25.8	17.2
Firewood/straw	27.8	4.4	22.6	26.9	32.3	53.8	0	7	34.2	51.2	5.5	42.7
Dung	0.4	0	0.5	1	0.5	0	0	0	0.3	1	0	0.7
<b>Source of drinking water</b>												
Piped Water												
Piped into home or plot	54.3	73.2	61.3	57.2	40.4	38.6	87.1	69.5	46.5	36.8	73.3	41.7
Public tap	30.1	23.9	29.6	34.8	37.4	24.9	11.8	18.4	30.6	47.2	17	38.8
Well water												
Well in residence/plot	6.3	1	1.5	1	1	27.4	1.2	11.4	6.6	2	9.3	4.3
Public shallow well	5.3	2	7.5	6.5	6.6	4.1	0	0.3	8.6	8.7	0.3	8.7
Public bore hole	2.6	0	0	0	8.6	4.6	0	0	3.7	5	0	4.3
Surface Water												
Spring	0	0	0	0	0	0	0	0	0	0	0	0
River/stream	0	0	0	0	0	0	0	0	0	0	0	0
Pond/lake	0	0	0	0	0	0	0	0	0	0	0	0
Tanker truck	0.5	0	0	0	2.5	0	0	0	1.7	0	0	0.8
Rainwater	0	0	0	0	0	0	0	0	0	0	0	0
Bottled Water	0.2	0	0	0	1	0	0	0	0.7	0	0	0.3
Other:												
Well at neighbor's plot	0.1	0	0	0	0	0.5	0	0.3	0	0	0.3	0
Neighbor's tap	0.6	0	0	0.5	2.5	0	0	0	1.7	0.3	0	1

Table 6: SES indicators (continued)

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
<b>Sanitation facility</b>												
Flush toilet												
Own flush toilet	17.7	32.7	12.6	25.9	14.1	2.5	64.7	26.3	5.6	7.4	34.5	6.5
Shared flush toilet	4.2	7.8	0.5	2.5	8.6	1.5	10.6	4.8	2.3	3.7	6	3
Pit toilet/ latrine												
Traditional pit latrine	46.1	25.4	34.2	46.8	46	79.2	7.1	31.4	50.2	68.6	26.3	59.3
Ventilated improved pit latrine	30.9	33.7	52.3	24.4	29.3	14.7	17.6	36.8	40.9	18.4	32.8	29.7
No facility/bush/field	0.9	0.5	0	0.5	1.5	2	0	0.3	1	1.7	0.3	1.3
Other:												
In the Sea/River	0.1	0	0	0	0.5	0	0	0.3	0	0	0.3	0
<b>Main material of floor</b>												
Natural floor												
Earth/sand	47.9	23.4	45.7	45.8	59.6	66	2.4	35.9	55.1	66.2	28.8	60.7
Dung	0.1	0	0	0	0	0.5	0	0	0	0.3	0	0.2
Rudimentary floor												
Wood planks	0	0	0	0	0	0	0	0	0	0	0	0
Palm/bamboo	0	0	0	0	0	0	0	0	0	0	0	0
Finished floor												
Parquet or polished wood	0	0	0	0	0	0	0	0	0	0	0	0
Vinyl or asphalt strips	2.6	2.9	7	3	0	0	0	2.5	5.3	0.7	2	3
Ceramic tiles	12.8	31.2	8	11.9	11.1	1	54.1	15.9	7.3	3.3	24	5.3
Cement	36	42.4	38.2	38.3	29.3	31.5	43.5	45.1	31.9	28.4	44.8	30.2
Carpet (not loose or scattered)	0.3	0	0.5	1	0	0	0	0	0.3	0.7	0	0.5

Table 7: Distribution of SES levels

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
1 (N = 200 ) LOW	20	4.4	16.6	9	25.3	45.7	0	5.7	22.9	37.8	4.5	30.3
2 (N = 200 )	20	10.7	18.1	28.4	26.8	16.2	3.5	13.3	23.3	28.4	11.3	25.8
3 (N = 200 )	20	21.5	23.1	23.9	14.6	16.8	9.4	19.4	24.9	18.7	17.3	21.8
4 (N = 200 )	20	28.3	27.6	15.4	15.2	13.2	25.9	27.6	19.6	10.7	27.3	15.2
5 (N = 200 ) HIGH	20	35.1	14.6	23.4	18.2	8.1	61.2	34	9.3	4.3	39.8	6.8

## SECTION 3

### KNOWLEDGE AND BELIEFS ABOUT MALARIA AND MOSQUITOES

---

The study sought to find out whether respondents had heard of the French term for malaria (“paludisme” or “palu” for short), what their level of knowledge about the symptoms and causes were, whether they knew which groups were most vulnerable to severe malaria, and whether they had received any information on avoiding malaria within the past year. Respondents were also asked when during the day they are most bothered by mosquitoes.

#### 3.1 RECOGNITION OF TERM “PALUDISME”

Respondents were asked whether they had heard of the French term for malaria —“paludisme” or “palu”— in order to find out the extent to which the term can be used in promotion activities. Use of a single term around which promotion activities could take place would be important in building common understanding of the term and the illness.

- Recognition of the term was high: the vast majority of respondents (86%) reported having heard of “paludisme/palu.”
- Recognition of the term was higher among urban (93%) than rural (80%) areas.

Table 8: Recognition of French term for malaria: “paludisme/palu”  
Among all respondents

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	205	199	201	198	197	85	315	301	299	400	600
Yes	85.5	87.8	80.4	90.5	75.3	93.4	96.5	92.4	75.7	84.9	93.3	80.3
No	14.5	12.2	19.6	9.5	24.7	6.6	3.5	7.6	24.3	15.1	6.8	19.7

#### 3.2 PERCEIVED SYMPTOMS AND CAUSES OF MALARIA

Malaria can exhibit a diverse set of symptoms, but fever is common to all symptomatic cases. In order to determine the extent to which respondent perceptions of malaria coincide with the biomedical concepts of the illness, respondents were asked what the symptoms and causes of malaria were.

- The main symptoms of malaria mentioned by respondents were “fever/hot body” (89%) or symptoms associated with fever: “headache” (46%); “feeling cold/chills” (32%); and “body ache” (28%). “Nausea” or “vomiting” were also commonly mentioned (52%). Only 4% mentioned “convulsions/fits,” a symptom of severe malaria.
- The vast majority of respondents who had heard of malaria knew that mosquitoes cause malaria (88%). However, 28% named *only* mosquitoes as the cause; 60% erroneously believed that there were additional causes of malaria as well, and 9% thought malaria was caused only by factors other than mosquitoes. Most commonly-named causes other than mosquitoes were dirty surroundings (29%), standing water (20%), getting hot or overexposed to the sun (17%), and being in the rain (13%).

Table 9: Perceived symptoms of malaria

Among respondents who have heard of malaria (multiple responses possible)

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	855	180	160	182	149	184	82	291	228	254	373	482
Fever	88.9	93.3	86.9	82.4	83.9	96.7	93.9	89	87.7	88.2	90.1	88
Chills/ shivering	32	30	23.8	23.1	30.9	51.1	22	36.4	28.1	33.9	33.2	31.1
Cough	11.5	8.3	17.5	20.3	5.4	5.4	7.3	10	11.4	14.6	9.4	13.1
Headache	45.5	42.2	48.8	39	41.6	55.4	42.7	53.3	41.2	41.3	50.9	41.3
Nausea or vomiting	51.8	55.6	51.9	46.2	39.6	63.6	53.7	50.2	51.8	53.1	50.9	52.5
Diarrhea	8.1	6.1	10.6	8.2	2	12.5	7.3	8.6	6.6	9.1	8.3	7.9
Dizziness	6.5	9.4	6.3	4.4	6.7	6	7.3	8.2	5.3	5.5	8	5.4
Loss of appetite	22.7	28.3	21.9	22	15.4	24.5	25.6	24.1	21.1	21.7	24.4	21.4
Body ache or joint pain	28.3	30.6	21.9	26.4	40.9	23.4	28	35.1	25.9	22.8	33.5	24.3
Pale eyes or palms	10.4	5.6	10.6	13.2	5.4	16.3	6.1	8.9	13.2	11	8.3	12
Convulsions/ fits	3.6	2.8	3.8	8.2	1.3	1.6	2.4	3.4	2.2	5.5	3.2	3.9
Weakness	20.4	16.7	35	22	12.8	15.8	13.4	26.8	14	20.9	23.9	17.6
Rash	0.9	0.6	1.9	1.1	0.7	0.5	0	0	1.8	1.6	0	1.7
Sneezing/running nose/cold	2.6	1.7	4.4	4.9	2	0	0	4.1	2.6	1.6	3.2	2.1
Eye problems	1.3	1.1	0	3.3	1.3	0.5	2.4	2.1	0.4	0.8	2.1	0.6
Lack of taste	0.6	1.1	0	0.5	1.3	0	2.4	0.7	0.4	0	1.1	0.2
Yellow urine	0.5	0.6	0	1.1	0	0.5	0	0	0	1.6	0	0.8
Unhappy/crying child	0.5	0	0.6	0.5	1.3	0	0	0.7	0.4	0.4	0.5	0.4
Sore/dry/pale mouth or lips	0.2	0.6	0	0.5	0	0	1.2	0	0.4	0	0.3	0.2
Constipation	0.2	0	0.6	0.5	0	0	0	0	0.9	0	0	0.4
Weight loss	0.1	0	0.6	0	0	0	0	0	0.4	0	0	0.2
Dehydration/thirsty	0.1	0.6	0	0	0	0	1.2	0	0	0	0.3	0
Change in skin color	0.1	0	0	0.5	0	0	0	0	0.4	0	0	0.2
Don't Know	2	2.2	3.8	2.2	2	0	1.2	0.3	4.4	2	0.5	3.1

Table 10: Perceived causes of malaria

Among respondents who have heard of malaria (multiple responses possible)

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	855	180	160	182	149	184	82	291	228	254	373	482
Mosquitoes	88.1	83.3	90	86.8	89.3	91.3	80.5	93.1	84.2	88.2	90.3	86.3
Being in the rain	12.5	16.7	18.1	12.1	9.4	6.5	24.4	11.7	7.9	13.8	14.5	11
Getting cold	1.4	1.7	0	0.5	2	2.7	1.2	1.4	1.8	1.2	1.3	1.5
Getting hot/sun overexposure	17.3	19.4	23.1	29.7	8.1	5.4	24.4	21	14	13.8	21.7	13.9
Drinking dirty water	1.8	5	1.3	0.5	0.7	1.1	3.7	0.3	1.8	2.8	1.1	2.3
Eating cold or dirty food	4.3	5.6	3.1	3.3	2.7	6.5	3.7	3.1	3.9	6.3	3.2	5.2
Overwork	0	0	0	0	0	0	0	0	0	0	0	0
God/Allah	2.3	2.2	5	1.1	2.7	1.1	0	2.1	1.8	3.9	1.6	2.9
Another person with malaria	5.0	5	5	4.4	4.7	6	6.1	7.6	4.8	2	7.2	3.3
Dirty surroundings	28.9	26.1	26.9	17	24.8	48.4	24.4	26.8	28.1	33.5	26.3	30.9
Standing water	19.9	11.1	20	17.6	22.8	28.3	7.3	25.1	21.9	16.1	21.2	18.9
Cow/spoilt milk/yogurt	1.2	1.7	3.1	0.5	0.7	0	1.2	1.4	1.3	0.8	1.3	1
Seasons (winter, maize, harvesting, change of, rainy)	1.1	2.8	0	1.6	0	0.5	3.7	0.7	1.3	0.4	1.3	0.8
Unripe fruit/vegetables	1.1	1.1	3.1	0.5	0.7	0	1.2	1.4	0.9	0.8	1.3	0.8
Travelling/changing environment	0.5	0.6	0	1.6	0	0	1.2	1	0	0	1.1	0
Bad hygiene	0.4	0	0	1.1	0	0.5	0	0.3	0.9	0	0.3	0.4
Bad diet	0.4	1.1	0	0	0	0.5	2.4	0	0.4	0	0.5	0.2
Fried/oily foods	0.2	0	0	0	0	1.1	0	0.7	0	0	0.5	0
Flies	0.1	0.6	0	0	0	0	0	0	0.4	0	0	0.2
Weather	0.1	0	0.6	0	0	0	0	0	0	0.4	0	0.2
Contaminated air	0.1	0	0	0.5	0	0	0	0.3	0	0	0.3	0
Other	2.7	5.6	1.3	3.3	1.3	1.6	6.1	1.7	3.9	1.6	2.7	2.7
Don't Know	3.5	4.4	2.5	1.6	4.7	4.3	3.7	1.7	6.1	3.1	2.1	4.6

Table 11: Knowledge that mosquitoes are the only cause of malaria  
Among respondents who have heard of malaria

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	855	180	160	182	149	184	82	291	228	254		
Mosquitoes only	28.4	24.4	25.6	33.0	35.6	24.5	23.2	27.5	27.6	31.9	26.5	29.9
Mosquitoes and other causes	59.5	58.3	64.4	53.8	53.7	66.8	56.1	65.6	56.6	56.3	63.5	59.5
Other causes only	8.5	12.8	7.5	11.5	6.0	4.3	17.1	5.2	9.6	8.7	7.8	8.5
Don't Know	3.5	4.4	2.5	1.6	4.7	4.3	3.7	1.7	6.1	3.1	2.1	3.5

### 3.3 KNOWLEDGE OF VULNERABLE GROUPS

In order to measure knowledge of vulnerable groups—children under five and pregnant women—respondents who recognized the term malaria were shown a page with drawings of five household members: a man, a woman (not pregnant), a pregnant woman, a child of age 3, and a child of age 6. They were asked to select the person most vulnerable to a serious case of malaria and to then select, among the remaining, who else is most vulnerable.

- The vast majority of respondents (86%) selected the correct drawings: that of the young child and the pregnant woman. There was little variation by site or by urban-rural location.
- Thirteen percent (13%) included in their selection a household member who was not among the most vulnerable: 10% selected a child of 6 years; 2% the non-pregnant woman; and 1.3% the man.

Table 12: Selection of vulnerable groups  
Among respondents who have heard of malaria (two responses possible)

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	855	180	160	182	149	184	82	291	228	254	373	482
Man	1.3	1.1	1.9	3.3	0	0	0	1.7	1.8	0.8	1.3	1.2
Woman	1.5	1.7	1.3	1.1	0.7	2.7	1.2	1.4	1.3	2	1.3	1.7
Pregnant women	92	95	92.5	90.1	93.3	89.7	93.9	94.2	92.5	88.6	94.1	90.5
Child of 6 years	9.7	6.7	11.3	12.1	7.4	10.9	7.3	6.5	7.9	15.7	6.7	12
Child of 3 years	93.7	92.8	91.9	92.9	96.6	94.6	92.7	94.8	93.4	92.9	94.4	93.2

Table 13: Knowledge of vulnerable groups  
Among respondents who have heard of malaria

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	855	180	160	182	149	184	82	291	228	254	373	482
Know vulnerable group (Pregnant woman and child under 5)	86.4	88.9	85.6	83	90.6	84.8	89	89.3	87.3	81.5	89.3	84.2
Does not know vulnerable group	13.6	11.1	14.4	17	9.4	15.2	11	10.7	12.7	18.5	10.7	15.8

### 3.4 EXPOSURE TO INFORMATION ON AVOIDING MALARIA

In order to obtain a general idea of the extent to which people are currently being given information about preventing malaria, respondents who had heard of “malaria” (“paludisme”) were asked whether they had received any information about preventing malaria in the past year. Those who had seen/heard something were asked where they heard it.

- The vast majority of respondents (91%) who had heard of malaria reported that they had received information about avoiding malaria in the past 12 months, with little variation by site or by urban-rural location. However, 7% of rural residents and 3% of urban residents had heard information *only* from non-professionals (friends,

- neighbors or relatives), rather than from more professional and presumably more reliable sources.
- There is good exposure to malaria information via the mass media. Of those respondents who had heard of malaria, 69% mentioned having heard information about avoiding the disease on the radio and 52% had heard information from TV. Interpersonal sources of information were also common: 36% had heard information from staff/personnel in health facilities; and 29% from neighbors or friends. The accuracy of information given by non-professionals is not known.
- The same proportion of urban and rural respondents (about 70%) had heard something about malaria prevention on the radio; however, TV was mentioned as a source for malaria prevention information by a higher percentage of urban (69%) than rural respondents (39%). Conversely, interpersonal sources were more common in rural areas: “friends/neighbors/relatives” was mentioned as a source by 36% of rural respondents, compared with 20% of urban respondents.

Table 14: Exposure to information on avoiding malaria  
Among respondents who have heard of malaria

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	855	180	160	182	149	184	82	291	228	254	373	482
Yes	91.3	90	92.5	89.6	94.6	90.8	90.2	93.1	89	91.7	92.5	90.5
No	8.7	10	7.5	10.4	5.4	9.2	9.8	6.9	11	8.3	7.5	9.5

Table 15: Exposure to information on avoiding malaria, by source  
Among respondents who have seen/heard information about malaria in the 12 months prior to the interview (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	781	162	148	163	141	167	74	271	203	233	345	436
Radio	69.4	63	60.8	68.7	70.9	82.6	58.1	72.3	70.9	68.2	69.3	69.5
Television	52	65.4	60.1	48.5	41.8	43.7	73	67.9	42.9	34.8	69	38.5
News paper/magazine	2.6	4.9	1.4	3.1	0.7	2.4	9.5	2.6	1.5	1.3	4.1	1.4
Staff at shop/pharmacy/market	0.5	1.2	0	1.2	0	0	2.7	0	1	0	0.6	0.5
Poster/notice at shop/pharmacy/market	1.5	2.5	0.7	0.6	2.1	1.8	2.7	1.1	1	2.1	1.4	1.6
Health staff/ personnel	35.7	27.8	41.2	47.2	22.7	38.3	24.3	35.4	32	42.9	33	37.8
Poster/notice at health facility	13.8	15.4	12.2	9.2	5.7	25.1	6.8	11.8	14.8	17.6	10.7	16.3
Church/mosque	0.4	0	0	0	2.1	0	0	0.4	1	0	0.3	0.5
School	2.2	0.6	1.4	4.9	2.8	1.2	0	3.3	2	1.7	2.6	1.8
Drama Group	2.4	3.7	1.4	3.7	2.8	0.6	4.1	2.2	2	2.6	2.6	2.3
Friends/Neighbors/Relatives	28.9	27.8	29.1	32.5	25.5	29.3	23	19.2	30.5	40.8	20	36
Civil servants	0.9	0	1.4	2.5	0.7	0	0	2.6	0	0	2	0
Organizations	0.5	0	1.4	0	0.7	0.6	0	0.7	0	0.9	0.6	0.5
Interviewer	0.4	0	0.7	1.2	0	0	0	0	0.5	0.9	0	0.7
Other	0.1	0	0.7	0	0	0	0	0	0	0.4	0	0.2
Don't Know	0.4	0	0	0	2.1	0	0	0.7	0	0.4	0.6	0.2

Table 16: Exposure to information from “non-professional” and “professional” sources  
Among respondents who have heard of malaria

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	781	162	148	163	141	167	74	271	203	233	345	436
“Non-professional” sources only	5.0	4.3	5.4	3.7	5.0	6.6	2.7	3.0	5.9	7.3	2.9	6.7
“Non-professional” and “professional” sources	23.9	23.5	23.6	28.8	20.6	22.8	20.3	16.2	24.6	33.5	17.1	29.4
“Professional” sources only	70.7	72.2	70.9	67.5	72.3	70.7	77.0	80.1	69.5	58.8	79.4	63.8
Don't know	0.4	0	0	0	2.1	0	0	.7	0	.4	.6	.2

### 3.5 MOSQUITO BITING PATTERNS

- When asked what time(s) of the day mosquitoes bite them the most, the vast majority of respondents (80%) said in the evening or night before sleeping, and 64% (also) said at night when they are sleeping.
- The proportion of those reporting that mosquitoes bother or bite them the most at night when they are sleeping was higher for rural (75%) than urban (47%) respondents.

Table 17: Time of day when mosquitoes bother or bite the most  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
Morning	4.8	6.8	5.5	3	6.1	2.5	9.4	3.5	3.3	6.4	4.8	4.8
Afternoon	3.4	2.4	4	1	6.1	3.6	3.5	3.8	3.7	2.7	3.8	3.2
Evening or night before sleeping	80.3	81	81.4	79.1	81.8	78.2	76.5	85.1	79.1	77.6	83.3	78.3
At night when sleeping	63.7	62	69.3	66.7	71.2	49.2	50.6	45.7	75.7	74.2	46.8	75
All day long	4.4	2.9	4.5	8	5.6	1	3.5	7	2.7	3.7	6.3	3.2
Don't Know	0.3	1	0	0	0	0.5	2.4	0.3	0	0	0.8	0

## SECTION 4

### MOSQUITO NETS

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#### 4.1 PERCEIVED ADVANTAGES AND DISADVANTAGES OF NET USE BY VULNERABLE GROUPS

Children under five and pregnant women are the most vulnerable to getting a serious case of malaria, and a key measure of the success of NetMark will be whether it achieves gains in the proportions of these vulnerable groups regularly sleeping under a treated net. All respondents, whether net owners or not, were asked (unprompted) what advantages and disadvantages they saw in a child under five sleeping under a net, in a child under five sleeping under a *treated* net, and in a pregnant woman sleeping under a *treated* net. NetMark qualitative research showed that perceived advantages/disadvantages for children under five and for pregnant women differed; therefore each of those groups was asked about separately. Further, questions about advantages/disadvantages of “sleeping under a net” were separated from the questions about “sleeping under a treated net” since qualitative research showed that the perceived benefits of and barriers to sleeping under a net were different from those for sleeping under an insecticide-treated net. Responses were unprompted and multiple responses were accepted.

Since many people may not have heard of sleeping under a treated net, it was necessary to introduce the concept before asking for a reaction to it. Before asking about perceptions of sleeping under a treated net, each respondent was told that a treated net was one that had insecticide solution on it. Then the questions about advantages and disadvantages were asked.

Given that perceptions may differ among those who are familiar with using nets and those who are not, in the tables that follow the data for the “advantages and disadvantages” questions are further broken down by net owners and non-owners.

##### **Advantages of sleeping under a mosquito net for child under five**

- Virtually all respondents (99%) named at least one advantage for a child under five sleeping under a mosquito net.
- The most commonly mentioned advantage of a child under five sleeping under a mosquito net was to “avoid getting bitten by mosquitoes” (89%). Other advantages frequently mentioned were “don’t get bothered by other insects/pests” (46%), “sleep better” (39%), and “avoid getting malaria” (40%, combining those using the French term “paludisme” or a local term for malaria).
- There were no differences between net owners and non-owners in perceived advantages of a child under five sleeping under a net.

Table 18: Perceived advantages of sleeping under a mosquito net for child under five  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non Owner
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600	336	664
Avoid getting bitten by mosquitoes	88.9	88.3	91.5	88.1	86.4	90.4	82.4	86.3	92	90.3	85.5	91.2	88.4	89.2
Avoid getting "malaria"	17.8	16.1	16.1	21.9	9.6	25.4	18.8	27.3	9	16.4	25.5	12.7	23.5	14.9
Avoid getting [local term for malaria]	22.5	23.9	28.1	25.4	26.8	8.1	18.8	23.8	23.9	20.7	22.8	22.3	17.6	25.0
Don't get bothered by other insects/other pests	45.5	36.1	57.3	43.3	35.4	55.8	28.2	49.5	46.8	44.8	45	45.8	42.9	46.8
Sleep better	39.0	36.6	38.2	42.8	35.9	41.6	40	44.1	32.6	39.8	43.3	36.2	39.0	39.0
Warmer/gives warmth	2.4	4.4	2.5	2	0.5	2.5	1.2	1	3.7	3	1.0	3.3	3.0	2.1
Protects against dust/dirt	8.9	11.7	7.0	7.5	10.6	7.6	7.1	7.6	9.3	10.4	7.5	9.8	7.1	9.8
Gives privacy	0.6	0.5	0	1.5	1.0	0	0	0.6	0	1.3	0.5	0.7	0.9	0.5
Saves money/time because child not sick	3.4	3.9	2	2	3	6.1	2.4	1.3	3.7	5.7	1.5	4.7	3.6	3.3
Is an economical/lasting solution	0.6	0.5	1	1.5	0	0	0	0.6	0.3	1	0.5	0.7	0.6	0.6
Won't develop rash/ spots/ pimples	0.7	0	0	2.5	1	0	0	0.3	1.3	0.7	0.3	1.0	1.5	0.3
Protects child	0.6	0.5	1.5	0.5	0.5	0	0	0.3	0	1.7	0.3	0.8	0.3	0.8
Avoids other illness	0.3	0	0	0	0	1.5	0	0	0.7	0.3	0	0.5	0	0.5
Child will have more space/ comfort	0.3	0.5	0	0.5	0	0.5	1.2	0	0.7	0	0.3	0.3	0.9	0
Gives fresh air	0.2	0	0	0	1	0	0	0.3	0	0.3	0.3	0.2	0	0.3
Won't suffer from cough/ sneezing/ breathing problems	0.2	1	0	0	0	0	0	0	0.7	0	0	0.3	0	0.3
No need to cover child when hot	0.1	0.5	0	0	0	0	0	0	0	0.3	0	0.2	0	0.2
Other	0.2	0	0.5	0.5	0	0	0	0	0.3	0.3	0	0.3	0.3	0.2
Don't Know	1	1	0.5	0	0.5	3	2.4	0.3	0.7	1.7	0.8	1.2	1.2	0.9

### Disadvantages of sleeping under a mosquito net for child under five

- The vast majority of respondents (85%) did not cite any disadvantage ("none" or "don't know any") for a child under five to sleep under a net: 80% said there were no disadvantages for a child under five sleeping under a net; another 5% said they did not know of a disadvantage.
- The small proportion of respondents who did mention disadvantages for a child under five sleeping under a mosquito net most often mentioned "child might get caught/trapped" (5%), "child may suffocate" (3%), and "it is hot sleeping under a net" (3%).
- There were no large differences between urban and rural respondents or net-owners or non-owners in any disadvantages mentioned.

Table 19: Perceived disadvantages of sleeping under a mosquito net for child under five  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non Owner
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600	336	664
It is hot sleeping under a net	2.5	5.4	2.5	1	3	0.5	2.4	1.3	2.3	4	1.5	3.2	2.7	2.4
Mosquitoes can still bite through the net	0.7	1.5	0	1.5	0.5	0	1.2	0	1	1	0.3	1	1.2	0.5
Mosquitoes can still get in the net	1.2	2	0.5	2	0.5	1	2.4	0.3	1.7	1.3	0.8	1.5	2.1	0.8
Mosquitoes still make noise	0.1	0.5	0	0	0	0	0	0	0	0.3	0	0.2	0	0.2
Difficult/inconvenient if child has to get up in the night	1.8	3.4	2	3	0	0.5	1.2	1.6	1.3	2.7	1.5	2	1.5	2
It takes time to tuck in the net each night	0.9	1	0.5	1.5	1	0.5	1.2	0.6	0.7	1.3	0.8	1	1.2	0.8
There is not enough air under the net	1.1	2	0	1.5	2	0	3.5	1	0.3	1.3	1.5	0.8	1.5	0.9
Child might suffocate	3.1	7.8	1.5	2	3.5	0.5	11.8	1.6	3	2.3	3.8	2.7	1.8	3.8
Child may tear net	1.2	2	1	0.5	2	0.5	2.4	1.6	0.3	1.3	1.8	0.8	1.2	1.2
Child might get caught/trapped	5.2	9.3	5	6.5	3.5	1.5	10.6	3.5	7.3	3.3	5	5.3	3	6.3
Child will get used to net and won't be able to sleep without it	0.4	0.5	0	1	0	0.5	0	0	0.3	1	0	0.7	1.2	0
Too expensive/can't afford net	1.1	2.4	2	0	1	0	1.2	0	1.3	2	0.3	1.7	0.6	1.4
Dangerous	0.2	1	0	0	0	0	2.4	0	0	0	0.5	0	0.3	0.2
Gets dirty easily	0.1	0.5	0	0	0	0	0	0	0	0.3	0	0.2	0	0.2
Other	0.1	0	0	0.5	0	0	0	0	0	0.3	0	0.2	0.3	0
None	80.1	66.3	87.4	82.1	80.8	84.3	62.4	87.6	79.7	77.6	82.3	78.7	81.8	79.2
Don't Know	4.5	3.9	1.5	2	3	12.2	5.9	3.5	3.7	6	4	4.8	4.8	4.4

### Advantages of sleeping under a *treated* net for child under five

- The vast majority of respondents (89%) named at least one advantage for a child under five sleeping under a *treated* net.
- The most commonly cited advantages for a child under five sleeping under a treated net were that it “kills mosquitoes” (42%), “repels mosquitoes away from net” (42%), “works better against mosquitoes than an untreated net” (33%) and “kills/repels other insects” (28%). These advantages were mentioned by a higher percentage of net-owners than non-owners. Respondents also mentioned that the child is more protected from malaria (26%, combining those who used the French term and those who used a local term).

Table 20: Perceived advantages of sleeping under treated mosquito net for child under five  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non Owner
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600	336	664
Works better against mosquitoes than an untreated net	33	27.8	44.7	28.9	23.2	40.6	20	36.5	33.6	32.4	33	33	37.5	30.7
Kills mosquitoes	41.6	30.7	49.2	48.8	51	28.4	29.4	43.8	44.5	39.8	40.8	42.2	47.6	38.6
Repels mosquitoes away from net	41.8	39.5	40.2	50.7	47	31.5	38.8	39.4	42.5	44.5	39.3	43.5	49.7	37.8
Kills/repels other insects or pests	27.9	17.6	33.7	35.3	30.3	22.8	20	36.8	22.6	26.1	33.3	24.3	30.4	26.7
Is better at preventing “malaria”	13.4	16.6	8.5	8	4.5	29.4	18.8	17.1	8	13.4	17.5	10.7	14.6	12.8
Is better at preventing [local term for malaria]	13.4	10.2	19.6	16.4	16.7	4.1	5.9	16.2	13.3	12.7	14	13	11.6	14.3
Child is more protected	23.7	22	27.6	32.3	16.2	20.3	28.2	32.7	19.3	17.4	31.8	18.3	21.7	24.7
Save more money/time because child is not sick	1.1	2	1	0	0	2.5	0	0.3	1	2.3	0.3	1.7	0.9	1.2
Sleeps better	1.2	2.4	0.5	1	2	0	0	0.3	2	1.7	0.3	1.8	0.9	1.4
Good health	0.7	1	1	0.5	1	0	1.2	0	0.7	1.3	0.3	1	0.6	0.8
Gives fresh air/keeps out dust	0.4	2	0	0	0	0	2.4	0	0.7	0	0.5	0.3	0	0.6
Prevents other illness	0.3	0.5	0	0.5	0	0.5	1.2	0	0.7	0	0.3	0.3	0.3	0.3
Other	0.1	0	0	0	0.5	0	0	0	0	0.3	0	0.2	0.3	0
None	2.6	2.9	4.5	4	0.5	1	2.4	1.9	3.3	2.7	2	3	2.4	2.7
Don't Know	8.2	13.2	5	0.5	8.1	14.2	14.1	2.2	8	13	4.8	10.5	6.8	8.9

## Disadvantages of sleeping under a *treated* net for child under five

- Over three-fourths (76%) of respondents did not cite any disadvantage (“none” or “don’t know any”) for a child under five to sleep under a *treated* net: 58% said that there were no disadvantages for a child under five sleeping under a *treated* net; another 18% said that they did not know of a disadvantage.
- The most commonly mentioned disadvantages were that the “chemical is dangerous” (11%) and that the “smell is bad” (10%). A small proportion of respondents mentioned that a treated net “causes irritation/cough” (5%), that the “child might chew/suck net” (4%), and that it “causes other illness” (3%).
- There were no large differences between urban and rural respondents or net-owners and non-owners in any disadvantages mentioned.

Table 21: Perceived disadvantages of sleeping under a treated mosquito net for child under five  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non Owner
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600	336	664
Insecticide is not effective	0.4	0	0	1	1	0	0	0.6	0	0.7	0.5	0.3	0.6	0.3
Smell is bad	9.6	8.8	12.6	19.4	5.1	2	9.4	11.1	8.3	9.4	10.8	8.8	11	8.9
Causes irritation/cough	4.7	7.3	4	8	3.5	0.5	10.6	5.1	2.3	5	6.3	3.7	5.1	4.5
Causes other illness	2.5	3.9	4	2.5	1.5	0.5	3.5	1.6	3	2.7	2	2.8	2.4	2.6
Child might chew/suck net	4.3	7.8	6	5.5	2	0	1.2	5.4	4	4.3	4.5	4.2	4.2	4.4
Chemical is dangerous	11.3	13.7	14.6	13.4	9.1	5.6	16.5	13	9	10.4	13.8	9.7	10.1	11.9
Chemical can kill child	1	2	0	1	0	2	1.2	0.6	1.3	1	0.8	1.2	0.6	1.2
Treated net can't be washed	0.2	1	0	0	0	0	0	0	0	0.7	0	0.3	0	0.3
May have side effects	0.6	1	0	1	1	0	1.2	0.6	0.3	0.7	0.8	0.5	0.9	0.5
Too hot under net	0.3	0.5	0	0	1	0	1.2	0	0	0.7	0.3	0.3	0	0.5
Might suffocate/difficult to breathe in contaminated air	0.2	0.5	0	0.5	0	0	0	0	0.7	0	0	0.3	0	0.3
Feel trapped/uncomfortable	0.1	0	0	0.5	0	0	0	0	0.3	0	0	0.2	0	0.2
Other	0.3	0.5	0	1	0	0	0	0	0.3	0.7	0	0.5	0.6	0.2
None	57.5	48.3	58.3	58.7	60.6	61.9	49.4	65.1	60.1	49.2	61.8	54.7	60.7	55.9
Don't Know	18.3	21	14.6	6	19.7	30.5	17.6	9.2	19.3	27.1	11	23.2	15.2	19.9

## Advantages of sleeping under a *treated* net for pregnant woman

- The vast majority of respondents (85%) named at least one advantage for a pregnant woman sleeping under a *treated* net.
- The most commonly mentioned advantages for a pregnant woman sleeping under a treated net had to do with the greater protection it affords: “kills mosquitoes” (35%), “repels mosquitoes away from the net” (37%), “pregnant woman is more protected” (30%), and “works better against mosquitoes than a net that has not been treated” (25%). Thirty-one percent (31%), using either the term “paludisme” or a local term, mentioned that a treated net is more effective at preventing malaria.

Table 22: Perceived advantages of sleeping under a treated mosquito net for pregnant woman  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non Owner
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600	336	664
Works better against mosquitoes than untreated net	25.2	22.9	31.2	23.9	15.7	32.5	11.8	24.4	28.6	26.4	21.8	27.5	28.9	23.3
Kills mosquitoes	35.2	25.9	46.2	38.3	42.9	22.8	29.4	33.3	37.5	36.5	32.5	37	42	31.8
Repels mosquitoes away from net	36.5	35.6	36.7	41.3	42.9	25.9	30.6	31.4	39.9	40.1	31.3	40	44	32.7
Kills/repels other insects or pests	21.8	10.7	32.7	23.9	21.2	20.8	10.6	29.5	17.6	21.1	25.5	19.3	25.3	20
Is better at preventing "malaria"	13.6	19	11.1	10.4	5.6	21.8	21.2	17.5	9.6	11.4	18.3	10.5	16.1	12.3
Is better at preventing [local name for malaria]	17.1	14.1	19.6	19.9	24.7	7.1	11.8	18.4	19.3	15.1	17	17.2	16.4	17.5
Is better at preventing miscarriage/stillbirth	5.1	5.9	2.5	6.5	7.1	3.6	12.9	4.8	5	3.3	6.5	4.2	3.9	5.7
Pregnant woman is more protected	30.4	31.7	23.1	36.3	29.3	31.5	40	36.5	24.6	27.1	37.3	25.8	30.7	30.3
Save more money/time because pregnant woman is not sick	2.7	3.4	1	1	1.5	6.6	2.4	1.3	5	2	1.5	3.5	2.1	3
Sleeps better	0.1	0	0	0.5	0	0	0	0	0.3	0	0	0.2	0.3	0
Prevents other illness	0.1	0	0	0	0	0.5	0	0	0.3	0	0	0.2	0	0.2
Good health	0.1	0	0	0.5	0	0	0	0	0.3	0	0	0.2	0	0.2
None	5.2	4.9	8.5	10	2	0.5	3.5	7.6	4	4.3	6.8	4.2	4.5	5.6
Don't Know	9.3	11.7	7.5	4	6.1	17.3	11.8	4.1	9	14.4	5.8	11.7	8	9.9

### Disadvantages of sleeping under a *treated* net for pregnant woman

- About three-fourths (73%) of respondents did not cite any disadvantages ("none" or "don't know any") of a pregnant woman sleeping under a *treated* net: 55% said that there were no disadvantages for a pregnant woman sleeping under a *treated* net; another 18% said they did not know of a disadvantage.
- The most commonly mentioned disadvantages had to do with smell and safety issues: that the "smell is bad" (13%), that the "chemical is dangerous" (12%) and that it "might make woman nauseated/vomit" (6%). These disadvantages were mentioned by a higher percentage of urban than rural respondents.

Table 23: Perceived disadvantages of sleeping under a mosquito net for pregnant woman  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural		Net Ownership	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	Net Owner	Non Owner
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600	336	664
Insecticide is not effective	0.1	0	0	0	0.5	0	0	0	0	0.3	0	0.2	0.3	0
Smell is bad	12.9	10.2	19.6	25.4	4.5	4.6	10.6	16.2	11.3	11.7	15	11.5	14.6	12
Causes irritation/cough	2.9	1.0	4.0	6.0	3.0	0.5	2.4	3.8	0.7	4.3	3.5	2.5	3.6	2.6
Causes other illness	3.2	5.4	4.0	5.0	1.5	0	3.5	1.6	4.7	3.3	2	4	2.1	3.8
Might make woman nauseated/vomit	6.3	11.2	7.0	7.5	2.0	3.6	10.6	7.0	4.7	6.0	7.8	5.3	5.4	6.8
Chemical is dangerous	11.9	13.2	14.1	19.4	5.6	7.1	15.3	14.9	8	11.7	15	9.8	11.9	11.9
Chemical can kill fetus/cause miscarriage	3.4	4.9	3.5	3.5	4.5	0.5	1.2	3.2	2.7	5	2.8	3.8	3	3.6
Treated net can't be washed	0.3	0	0	0.5	0	1.0	0	0.3	0.7	0	0.3	0.3	0.6	0.2
Treated net gets dirty	0.6	0.5	0	0	0	2.5	0	0.3	0.7	1	0.3	0.8	1.2	0.3
Too hot under net	0.4	1.0	0	0.5	0.5	0	1.2	0.3	0.3	0.3	0.5	0.3	0	0.6
Might suffocate/difficult to breathe/breath in contaminated air	0.4	2.0	0	0	0	0	2.4	0	0.7	0	0.5	0.3	0	0.6
May have side effects	0.3	0	0.5	0	1	0	0	0	0.7	0.3	0	0.5	0.6	0.2
Woman might become anemic	0.1	0	0	0.5	0	0	0	0	0.3	0	0	0.2	0	0.2
Causes fainting/dizziness	0.1	0	0	0	0.5	0	0	0.3	0	0	0.3	0	0.3	0
Other	0.3	0.5	0	1	0	0	1.2	0	0	0.7	0.3	0.3	0.6	0.2
None	55.2	53.7	53.8	50.2	63.1	55.3	51.8	61.6	59.8	44.8	59.5	52.3	56.3	54.7
Don't Know	18.0	16.6	15.1	6.5	21.2	31	12.9	8.3	18.3	29.4	9.3	23.8	16.4	18.8

## 4.2 ACCESS TO MOSQUITO NETS

Improving access to nets is a primary objective of the NetMark partnership, as access is a pre-requisite for ownership. All respondents, whether a net-owner or not, were asked where the nearest place was where they could purchase a net. They were also asked what mode of transport they would take to get there, and how long it would take to get there.

- About half (52%) of respondents reported that an open air/structured market is the nearest place where they could buy a mosquito net. There was some variation by site, but responses among urban and rural respondents were similar.
- In a number of sites, a non-commercial source (clinic, hospital, or health service) was the closest source of nets for many people. In St. Louis, 39% named a health facility as the nearest place they could obtain a net; in Kaolack, 26% did so.
- Overall, 10% said that nets were unavailable or that they did not know where the nearest place they could buy a net was. The greatest proportion of those who said nets were unavailable or did not know where to get them were located in the Dakar (24%) and Thies sites (19%).
- Almost half (47%) of the respondents who named a place to obtain a net reported that they would walk to get there; 33% said they would take the bus; and 17% would go by car.
- The average amount of time respondents reported that it would take them to get to the nearest place where they can purchase a mosquito net was 13 minutes by foot, 40 minutes by bus, and 36 minutes by car. The amounts of time, however, for each mode of transportation varied considerably since the standard deviations were quite high.

Table 24: Nearest place households can purchase mosquito nets  
Among all households

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
Not available	7.3	12.2	9.5	6	1.5	7.1	4.7	3.5	8	11.4	3.8	9.7
Open air/structured market	51.6	59	45.7	39.8	62.6	50.8	64.7	49.5	52.8	48.8	52.8	50.8
Local kiosk	0.2	0	0	0	0	1	0	0.6	0	0	0.5	0
Street/table top vendor	0.3	0.5	0	0	0	1	1.2	0.6	0	0	0.8	0
General shop	4.2	2	4	2.5	1	11.7	3.5	1.3	5.6	6	1.8	5.8
Textile/clothes shop/bedding shop	5.9	6.8	5	1.5	2.5	13.7	5.9	6	2	9.7	6	5.8
Wholesaler	1.7	1	0	1	0	6.6	2.4	2.9	1	1	2.8	1
Pharmacy/chemist	0.5	0	0.5	2	0	0	0	0.6	1	0	0.5	0.5
Drug store	0	0	0	0	0	0	0	0	0	0	0	0
Supermarket	0.1	0.5	0	0	0	0	0	0	0	0.3	0	0.2
Mini-mart	0	0	0	0	0	0	0	0	0	0	0	0
Project (e.g. NGO)	0.7	0	1.5	0.5	1.5	0	0	0.3	0.3	1.7	0.3	1
Clinic/hospital	10.7	2.9	12.6	19.4	14.1	4.6	0	3.8	14.6	17.1	3	15.8
Health services	8.5	2.4	8	19.4	12.1	0.5	3.5	21.9	3.7	0.7	18	2.2
Organizations	1	0.5	3	1	0.5	0	0	0.6	1	1.7	0.5	1.3
Other	0.1	0	0.5	0	0	0	0	0.3	0	0	0.3	0
Don't Know	7.2	12.2	9.5	7	4	3	14.1	7.9	10	1.7	9.3	5.8

Table 25: Mode of transport to get to nearest place where net purchase can be made  
Among households that know of the nearest place where they can purchase a mosquito net

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	855	155	161	175	187	177	69	279	247	260	348	507
By foot/walk	46.5	43.2	39.8	62.9	24.1	63.3	53.6	39.4	47.4	51.5	42.2	49.5
By bus	33.1	35.5	37.9	24.6	49.2	18.1	18.8	36.2	39.7	27.3	32.8	33.3
By car	16.8	21.3	9.9	11.4	25.1	15.8	27.5	19.7	12.6	15	21.3	13.8
Animal cart	3.2	0	12.4	1.1	0	2.8	0	3.6	0.4	6.2	2.9	3.4
Motorcycle (Boda-Boda)	0.4	0	0	0	1.6	0	0	1.1	0	0	0.9	0

Table 26: Length of time it takes by foot to get to nearest place where net could be purchased  
Among respondents who would travel by foot to get to nearest place

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	398	67	64	110	45	112	37	110	117	134	147	251
Mean no. of minutes	13.28	14.21	12.39	12.21	11.31	15.08	12.97	18.19	11.14	11.21	16.88	11.18
Standard Deviation	10.78	9.77	12.03	10.59	9.64	11.07	8.07	12.43	9.07	10.12	11.68	9.63
Median value	9.55	9.5	6.33	9.28	8.64	9.81	8.96	13.25	9.17	9.14	12.47	9.15

Table 27: Length of time it takes by bus to get to nearest place where net could be purchased  
Among respondents who would travel by bus to get to nearest place

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	283	55	61	43	92	32	13	101	98	71	114	169
Mean no. of minutes	40.41	44.69	31.16	55.6	29.97	60.31	40.23	19.93	37.81	73.18	22.25	52.67
Standard Deviation	60.51	31.8	27.24	96.34	64.67	63.24	43.08	18.39	28.43	105.47	23.2	73.54
Median value	25.25	30.5	24.25	27.83	14.25	28	21	14.29	29.55	36.07	16	31.4

### 4.3 AFFORDABILITY OF MOSQUITO NETS

One of the objectives of NetMark is to make ITMs more affordable. Affordability of nets is being monitored in several ways, mostly via other NetMark-sponsored studies. “Willingness to pay” information was gathered as part of market research conducted by Research International; and data on price of nets is being monitored using periodic retail audits and manufacturers’ sales data.

This household survey contains two supplementary measures of affordability. On the assumption that actual price paid is a good indicator of affordability, respondents were asked how much they paid for each net owned. Data on price of nets is found in “Characteristics of Nets Owned” (Section 4.5). Respondents from households without nets were asked why they did not own any nets. “Cost/can’t afford” is one response category, serving as a measure of the extent to which respondents perceive nets to be too expensive. Data on this question are found at the end of the following section on “Mosquito net ownership.”

### 4.4 MOSQUITO NET OWNERSHIP

One of the main topics of interest is net ownership or “coverage”—both the extent of coverage and pattern of coverage in terms of characteristics such as household socio-economic status and location. Respondents were asked if their household owned any mosquito nets, and, if so, how many. “Net” refers to any type or shape of net except baby nets (small umbrella-type nets that only fit an infant). Respondents from households without nets were asked why they did not own a net.

#### Ownership patterns

- One-third (34%) of households reported owning one or more mosquito nets. This figure may be higher than the national average, given that some of the sample sites — St. Louis and Kaolack — have active net promotion projects.
- There was great variation by site in the proportion of households that owned mosquito nets, ranging from 18% in the Dakar site and 55% in St. Louis. (Recall that in St. Louis, nets were available through health facilities.)
- Ownership was highest in the far rural areas (43%) and lowest in Dakar proper (19%).
- Ownership was higher among lower SES households than higher SES households.
- About half (52%) of net-owning households owned more than one net; 24% owned two nets and 14% owned three. Households in St. Louis tended to own multiple nets.

Table 28: Household ownership of mosquito nets  
Among all households

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600	200	200	200	200	200
Yes	33.6	18	20.6	55.2	25.3	49.2	18.8	31.4	30.6	43.1	28.8	36.8	36.5	42	32	27.5	30
No	66.4	82	79.4	44.8	74.7	50.8	81.2	68.6	69.4	56.9	71.3	63.2	63.5	58	68	72.5	70

Table 29: Number of mosquito nets owned  
Among households owning mosquito nets

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	336	37	41	111	50	97	16	99	92	129	115	221	73	84	64	55	60
1	47.9	73	58.5	26.1	68	48.5	75	56.6	53.3	34.1	59.1	42.1	42.5	46.4	50	45.5	56.7
2	24.4	16.2	31.7	30.6	10	24.7	6.3	16.2	23.9	33.3	14.8	29.4	32.9	27.4	18.8	27.3	13.3
3	14.3	5.4	2.4	21.6	16	13.4	12.5	15.2	14.1	14	14.8	14	9.6	15.5	20.3	14.5	11.7
4	7.4	5.4	7.3	7.2	4	10.3	6.3	11.1	4.3	7	10.4	5.9	8.2	4.8	1.6	9.1	15
5+	6	0	0	14.4	2	3.1	0	1	4.3	11.6	0.9	8.6	6.8	6	9.4	3.6	3.3
Mean no. of nets	2.1	1.43	1.59	2.77	1.74	1.99	1.5	1.87	1.92	2.47	1.82	2.24	2.08	2.06	2.23	2.02	2.1
Standard deviation	1.58	0.83	0.87	1.94	1.61	1.28	0.97	1.23	1.48	1.87	1.2	1.73	1.33	1.52	1.96	1.25	1.81

## Reasons for non-ownership

- Half (50%) of respondents from non-net owning households reported that a reason why they don't own any mosquito nets is because they "don't have any/enough money". There is a direct linear relationship between SES and respondents' perception that they "don't have enough money": the higher the SES, the less likely the respondent was to state this reason for non-ownership. Twenty-four percent (24%) reported that they don't need them. Ten percent (10%) said that nets were not available or that they did not know where to get them.
- A higher percentage of rural (57%) than urban (39%) households reported lack of money as a reason for non-ownership, whereas a higher percentage of urban (32%) than rural households (18%) said they don't need nets.
- Twenty four percent (24%) said they did not need nets. A high percentage of these respondents were from Dakar proper and/or of high SES status.

Table 30: Reasons why households do not own any mosquito nets  
Among households that do not own mosquito nets (multiple responses possible)

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	664	168	158	90	148	100	69	216	209	170	285	379	127	116	136	145	140
Don't have any/enough money	49.5	36.2	56.3	44.4	56.8	55	15.9	47.7	55.5	58.2	40	56.7	69.3	72.4	47.1	40	23.6
Not available/don't know where to get them	9.6	10.1	13.3	10	7.4	6	10.1	7.4	9.6	12.4	8.1	10.8	7.1	6	12.5	12.4	9.3
Don't like them	2.6	2.4	0	5.6	2.7	4	1.4	5.6	1	1.2	4.6	1.1	0	0.9	1.5	3.4	6.4
Don't need them	24.1	32.7	25.9	21.1	12.8	26	46.4	27.3	19.1	17.1	31.9	18.2	11	13.8	24.3	26.9	41.4
Nets won't fit on sleeping space	2.9	2.4	1.3	5.6	3.4	3	2.9	3.7	2.9	1.8	3.5	2.4	3.1	0	2.2	4.1	4.3
Use/prefer another form of protection	2.3	4.8	1.3	1.1	0.7	3	7.2	0.9	1.4	2.9	2.5	2.1	0	0	4.4	3.4	2.9
Not used to nets/inconvenient	2	4.8	0	1.1	2.7	0	5.8	0.5	1.4	2.9	1.8	2.1	2.4	0.9	0.7	2.8	2.9
Not aware/never thought about it	1.5	1.2	1.9	2.2	2	0	1.4	2.8	1	0.6	2.5	0.8	0	0.9	2.2	2.1	2.1
Plan to but haven't bought one yet	1.4	0	2.5	2.2	2	0	0	0.9	2.4	1.2	0.7	1.8	1.6	1.7	0.7	2.1	0.7
Not ready to buy one yet/will buy in rainy season	0.9	2.4	0	1.1	0.7	0	1.4	0.5	1.9	0	0.7	1.1	0	0	1.5	0.7	2.1
Mislaid/stolen/given away	0.6	0.6	0.6	2.2	0	0	0	1.4	0.5	0	1.1	0.3	0	0	2.2	0	0.7
Too small/need for whole household	0.5	1.2	0.6	0	0	0	0	0	1	0.6	0	0.8	0	1.7	0	0.7	0
It is damaged/worn out	0.3	0.6	0	1.1	0	0	1.4	0	0.5	0	0.4	0.3	0	1.7	0	0	0
Not enough air/too hot	0.3	1.2	0	0	0	0	0	0	0.5	0.6	0	0.5	0.8	0	0.7	0	0
Children will tear it	0.3	0	0.6	1.1	0	0	0	0.9	0	0	0.7	0	0	0	0	0.7	0.7
Other	0.2	0	0	1.1	0	0	0	0.5	0	0	0.4	0	0	0	0	0	0.7
Don't Know	8.6	8.9	3.2	7.8	16.2	6	14.5	7.9	7.7	8.2	9.5	7.9	7.9	3.4	10.3	10.3	10

## 4.5 CHARACTERISTICS OF NETS OWNED

Respondents in net-owning households were asked, for each net owned, where the net was obtained, when the net was acquired, and what brand, size, shape and price it was. They were also asked how often, if at all, the net was washed, since effectiveness of the treatment diminishes with washing, and frequency of washing will affect decisions about insecticide formulations. In these analyses, the base is the total number of nets owned by households (649).

### Where nets were obtained

- About half (51%) of the nets owned by households were purchased in a market. A slightly higher percentage of nets were bought in a market in rural areas (53%) as compared to urban areas (46%). The proportion of nets obtained from other commercial outlets was low: 6% of nets were bought in a textile shop, and 5% from a general shop.
- Overall, 14% of nets were obtained from non-commercial outlets, such as a clinic or health service, project or organization. The proportion of nets from non-commercial sources was highest in St. Louis (18%) and Thies (17%).
- Twelve percent (12%) of nets owned by households were received as a gift. The percentage of nets received as gifts was much higher in the urban capital (29%) than in other urban (18%), near rural (9%), or far rural (8%) locations. In addition, the percentage of nets received as gifts was much higher in the Thies (25%) and Kaolack (23%) sites than in the other sites.

Table 31: Place where net was obtained  
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	649	53	65	265	80	186	24	181	164	280	205	444
Market	51	47.2	30.8	56.2	38.8	57	45.8	45.9	40.2	61.1	45.9	53.4
Kiosk	1.5	0	0	3.8	0	0	0	0	0	3.6	0	2.3
Street vendor	0.2	1.9	0	0	0	0	4.2	0	0	0	0.5	0
General shop	4.6	1.9	4.6	1.5	0	11.8	0	3.3	6.7	4.6	2.9	5.4
Textile shop	6.3	1.9	4.6	5.3	1.3	11.8	0	6.6	3	8.6	5.9	6.5
Wholesaler	0.5	0	1.5	0	0	1.1	0	0	0	1.1	0	0.7
Pharmacy	0.3	0	0	0.8	0	0	0	0	1.2	0	0	0.5
Drug store	0	0	0	0	0	0	0	0	0	0	0	0
Supermarket	0	0	0	0	0	0	0	0	0	0	0	0
Project	3.1	0	10.8	3.4	5	0	0	0	9.8	1.4	0	4.5
Organizations	1.1	0	1.5	2.3	0	0	0	3.3	0.6	0	2.9	0.2
Clinic	5.5	7.5	3.1	6.4	6.3	4.3	0	3.9	9.8	4.6	3.4	6.5
Health services	3.9	1.9	1.5	5.7	8.8	0.5	4.2	9.4	3.7	0.4	8.8	1.6
School	0	0	0	0	0	0	0	0	0	0	0	0
Gift	11.9	18.9	24.6	6.4	22.5	8.6	29.2	18.2	8.5	8.2	19.5	8.3
Employer	0.9	1.9	7.7	0	0	0	0	2.2	0.6	0.4	2	0.5
Bought abroad	0.2	0	0	0	1.3	0	0	0.6	0	0	0.5	0
Other	1.2	0	6.2	1.5	0	0	0	1.7	0	1.8	1.5	1.1
Don't Know	7.9	17	3.1	6.8	16.3	4.8	16.7	5	15.9	4.3	6.3	8.6

Table 32: Type of source where net was obtained  
Among total number of nets owned

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
Informal Commercial Source	52.7	49.1	30.8	60	38.8	57	50	45.9	40.2	64.6	46.3	55.6	67.4	55.6	45.5	34.6	54.8
Formal Commercial Source	15.6	5.7	12.3	13.2	10	25.3	4.2	19.3	14.6	14.6	17.6	14.6	13.9	18.1	8.9	23.4	13.9
Non Commercial Source	10.6	9.4	23.1	12.1	11.3	4.3	0	9.4	20.7	6.4	8.3	11.7	6.9	11.3	12.2	16.8	7
Gift	11.9	18.9	24.6	6.4	22.5	8.6	29.2	18.2	8.5	8.2	19.5	8.3	7.6	7.5	16.3	14	16.5
Other	1.4	0	6.2	1.5	1.3	0	0	2.2	0	1.8	2	1.1	2.8	0.6	0.8	1.9	0.9
Don't Know	7.9	17	3.1	6.8	16.3	4.8	16.7	5	15.9	4.3	6.3	8.6	1.4	6.9	16.3	9.3	7

## Age of nets owned

- Net ownership has increased in recent years: 45% of nets owned by households were acquired within the past 2 years. A higher percentage of nets in urban households (52%) were acquired within the past 2 years than nets in rural households (42%).
- Nineteen percent (19%) of nets were acquired 5 or more years ago. Nets in rural households tend to be older: 21% of nets in rural households were acquired 5 or more years ago, compared with 13% of nets in urban households.

Table 33: Number of years households have owned their nets  
Among total number of household nets

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	649	53	65	265	80	186	24	181	164	280	205	444
0-<1 year	25.1	35.8	32.3	21.9	42.5	16.7	41.7	33.7	35.4	12.1	34.6	20.7
1-<2 years	19.9	18.9	15.4	19.6	25	19.9	20.8	16.6	18.3	22.9	17.1	21.2
2-<3 years	17.7	18.9	23.1	17.7	12.5	17.7	12.5	22.1	12.2	18.6	21	16.2
3-<4 years	8.2	7.5	4.6	8.3	5	10.8	12.5	3.9	6.1	11.8	4.9	9.7
4-<5 years	6.8	1.9	15.4	6	6.3	6.5	0	7.2	7.3	6.8	6.3	7
5+ years	18.5	11.3	9.2	21.1	5	25.8	12.5	12.7	17.7	23.2	12.7	21.2
Don't know	3.9	5.7	0	5.3	3.8	2.7	0	3.9	3	4.6	3.4	4.1

## Brand of nets owned

- It was difficult to obtain information on brands of nets, since consumers who owned commercial (non tailor-made) nets did not know the brand.
- Approximately 19% of nets owned by households were tailor-made (non-manufactured) and therefore unbranded. Tailor-made nets were more common in urban (26%) than rural (16%) areas. They were especially common in and around the Thies site, where almost one-half (45%) of household nets were tailor-made.

Table 34: Net brands owned  
Among total number of household nets

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	649	53	65	265	80	186	24	181	164	280	205	444
PowerNET	0.3	0	0	0.8	0	0	0	0	1.2	0	0	0.5
Tailor-made (non-manufactured)	19.4	28.3	44.6	29.1	5	0.5	33.3	24.9	9.1	20.7	25.9	16.4
Made in China/Japan/Thailand	0.6	0	0	1.5	0	0	0	2.2	0	0	2	0
Other	0.6	0	0	1.1	0	0.5	0	1.7	0	0.4	1.5	0.2
Don't Know	78.9	71.7	55.4	67.5	95	98.4	66.7	70.7	89.6	78.9	70.2	82.9

## Size and shape of nets owned

- The great majority of nets owned were either king (44%) or double (43%) nets. Nine percent (9%) of nets were single-size.
- The vast majority of nets (88%) were rectangular-shaped. Only 9% of nets were round/conical. Rectangular nets were more common in rural (91%) than in urban (82%) areas, whereas round/conical nets were more common in urban (13%) than in rural (7%) areas.

Table 35: Size of nets owned  
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	649	53	65	265	80	186	24	181	164	280	205	444
Cot net	0.2	0	0	0.4	0	0	0	0	0	0.4	0	0.2
Single	8.8	18.9	7.7	7.2	2.5	11.3	0	6.6	11.6	9.3	5.9	10.1
Double	42.8	39.6	50.8	43	43.8	40.3	54.2	43.6	43.3	41.1	44.9	41.9
King	44.4	37.7	35.4	44.9	53.8	44.6	37.5	47.5	42.1	44.3	46.3	43.5
<b>Other:</b>												
Three quarter	0.2	0	0	0	0	0.5	0	0	0	0.4	0	0.2
Other	1.2	0	6.2	0.4	0	1.6	0	1.7	2.4	0.4	1.5	1.1
Don't Know	2.3	3.8	0	4.2	0	1.1	8.3	0.6	0	4.3	1.5	2.7

Table 36: Shape of nets owned  
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	649	53	65	265	80	186	24	181	164	280	205	444
Rectangular	88.1	71.7	87.7	96.2	77.5	86	62.5	85.1	91.5	90.4	82.4	90.8
Round/conical	8.6	18.9	9.2	3.4	18.8	8.6	25	11.6	6.7	6.4	13.2	6.5
Triangle/pyramid	1.1	3.8	0	0	3.8	1.1	4.2	2.2	0.6	0.4	2.4	0.5
Wedge	1.4	5.7	3.1	0.4	0	1.6	8.3	1.1	0.6	1.4	2	1.1
Don't know/can't recall	0.8	0	0	0	0	2.7	0	0	0.6	1.4	0	1.1

## Cost of nets owned

Respondents were asked what the cost of each net owned was. These figures should be taken as very general estimates because one-third of respondents did not know the price, because of potential problems with recall for older nets, and because of currency devaluations over time.

- Households reported paying an average of 4164 XAF (5.32 USD) per net (conversion based on the exchange rate for the dollar on the date of the data collection). Respondents did not know the cost for a high percentage (34%) of their nets.
- Urban households and households with higher SES paid less for their nets than did households in the lower SES categories.

Table 37: Average cost of (all) nets (XAF)

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	649	53	65	265	80	186	24	181	164	280	205	444	144	160	123	107	115
Average price	4164	3442	3622	4265	3770	4464	3688	3434	3938	4728	3452	4480	4460	4802	4245	3546	3442
Std Dev	1809	1873	1519	2128	1466	1349	2086	1426	1487	1958	1473	1857	1810	1887	2008	1312	1523
Trade/Barter (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Free (%)	11.2	15.1	33.8	9.4	18.8	1.6	25	16.6	16.5	3.6	17.6	8.3	0	6.3	10	13.8	12.1
Don't Know (%)	34.2	35.8	24.6	32.5	33.8	39.8	41.7	27.6	36.6	36.4	29.3	36.5	0	42.4	29.4	43.9	29.9

Table 38: Average cost of (all) nets in (USD)

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	649	53	65	265	80	186	24	181	164	280	205	444	144	160	123	107	115
Average price	5.32	4.4	4.62	5.45	4.81	5.7	4.71	4.38	5.03	6.04	4.41	5.72	5.69	6.13	5.42	4.53	4.39
Std Dev	2.31	2.39	1.94	2.72	1.87	1.72	2.66	1.82	1.9	2.5	1.88	2.37	2.31	2.41	2.56	1.67	1.94
Trade/Barter (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Free (%)	11.2	15.1	33.8	9.4	18.8	1.6	25	16.6	16.5	3.6	17.6	8.3	0	6.3	10	13.8	12.1
Don't Know (%)	34.2	35.8	24.6	32.5	33.8	39.8	41.7	27.6	36.6	36.4	29.3	36.5	0	42.4	29.4	43.9	29.9

## Net washing patterns

- The majority (74%) of nets owned had been washed at least once.
- There was great variation in washing frequency. Half (50%) of nets that had been washed were reportedly washed once a month or more often, but 18% of nets that had been washed were washed about once a year. Nets tended to be washed less frequently in rural areas.

Table 39: Net ever washed  
Among total number of nets owned

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	649	53	65	265	80	186	24	181	164	280	205	444
Yes	74.4	67.9	67.7	74.3	61.3	84.4	62.5	70.2	64.6	83.9	69.3	76.8
No	22.2	24.5	30.8	23	33.8	12.4	25	26	34.1	12.5	25.9	20.5
Don't know	3.4	7.5	1.5	2.6	5	3.2	12.5	3.9	1.2	3.6	4.9	2.7

Table 40: Net washing frequency  
Among nets that had been washed

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tambacounda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	483	36	44	197	49	157	15	127	106	235	142	341
About once a year	17.8	13.9	15.9	19.3	22.4	15.9	20	13.4	16	20.9	14.1	19.4
About every six months	10.6	5.6	6.8	10.7	8.2	13.4	0	7.1	17.9	9.8	6.3	12.3
About every three months	18.0	33.3	22.7	16.8	14.3	15.9	13.3	10.2	22.6	20.4	10.6	21.1
About once a month	22.4	19.4	34.1	17.8	16.3	27.4	20	29.9	17.9	20.4	28.9	19.6
About every two weeks	13.0	11.1	4.5	13.2	26.5	11.5	20	22.8	6.6	10.2	22.5	9.1
About once a week	14.5	13.9	13.6	20.3	4.1	10.8	26.7	12.6	13.2	15.3	14.1	14.7
When it is dirty	1.0	0	2.3	0	8.2	0	0	3.1	0.9	0	2.8	0.3
3 times a year	0.6	0	0	1	0	0.6	0	0	0	1.3	0	0.9
Once every 2/3years	0.2	2.8	0	0	0	0	0	0	0.9	0	0	0.3
Other	1.4	0	0	0.5	0	3.8	0	0.8	3.8	0.9	0.7	1.8

## 4.6 MOSQUITO NET TREATMENT

Nets that are treated with an insecticide are much more effective against mosquito bites (and therefore malaria) than untreated nets. The insecticide kills and repels mosquitoes and other insects, even if the net is torn or is not completely tucked in. An ITN also affords some protection for others sleeping in the same room, even if they are not sleeping under the net. Nets that are “pretreated” (i.e., already have insecticide on them when purchased) are beginning to be available in some areas, but even these nets need to be treated/re-treated (“post-treated”) regularly to remain effective.

In one section of the survey, all respondents were asked if they had heard of treating nets with an insecticide. Later, respondents living in net-owning households were asked whether their nets had ever been treated. For each net treated, respondents were asked how many months it has been since the last treatment, total number of post-treatments, product used to treat the nets, place where it was obtained, and how much it cost. Respondents were also asked how many times, if any, the net had been washed since last treatment.

- Most respondents (70%) had heard of treating mosquito nets with an insecticide. Awareness of ITNs was higher in urban (76%) than rural (66%) areas and differed greatly by site—awareness of ITNs was highest in St. Louis (89%) and lowest in Tambacounda (59%). Respondents in higher SES households and in urban areas were more likely than others to have heard of treated nets. Eleven percent (11%) of households owned a treated mosquito net.
- Thirty percent (30%) of nets had ever been treated: 18% had been pretreated with insecticide before purchase/acquisition and 15% were treated after purchase/acquisition. Treated nets were most common in the highest SES category (category 5).
- The percentage of pretreated nets was higher in urban areas (27%) than in rural areas (14%) and decreased with distance from the urban capital. In addition, there was great variation by site in the proportion of household nets that were pretreated, ranging from 7% in Tambacounda to 39% in Kaolack.
- There appeared to be little difference in the percentage of post-treated nets in rural (16%) and in urban areas (13%). The percentage of nets that were treated after acquisition was highest in the St. Louis site (23%) and lowest in the Dakar area (2%). Among the 15% of nets that had been post-treated, the average amount of time since last treatment was 5.61 months. Nets that were less than 2 years old were post-treated 1-2 times.
- Almost all net treatments were obtained from non-commercial sources such as clinics (49%) or hygiene services (22%). Lower SES households were more likely to obtain the treatment from a non-commercial source such as a clinic or project than higher SES households. Twenty percent (20%) of respondents said they did not know where they got the treatment. Respondents were unaware what product was used to treat the net.
- About half of the households did not know the cost of the insecticide treatment. The great majority of those who reported a price said they paid \$1.00 or less per insecticide treatment.
- For one-third (33%) of the treated nets, respondents did not know the number of times the net was washed since

it was last treated. Forty-four percent (44%) of nets were never washed since last treated, 12% were washed 1-2 times, 2% 3-4 times, and 5% 5-8 times.

Table 41: Awareness of insecticide treated mosquito nets  
Among all respondents

	Site					Location				Urban/Rural		Socio-Economic Status					
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba- counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600	200	200	200	200	200
Yes	70.2	60.5	67.3	89.1	73.7	59.4	69.4	78.1	67.1	64.5	76.3	65.8	53	71	66.5	77.5	82
No	29.8	39.5	32.7	10.9	25.3	40.6	30.6	21.9	32.6	35.1	23.8	33.8	46.5	29	33.5	22.5	17.5

Table 42: Household ownership of treated (pre and/or post) mosquito nets  
Among all households

	Site					Location				Urban/Rural		Socio-Economic Status					
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba- counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600	200	200	200	200	200
Yes	11	2.9	9	24.9	11.6	6.6	4.7	11.4	9.3	14	10	11.7	9	15.5	9.5	9	12
No	89	97.1	91	75.1	88.4	93.4	95.3	88.6	90.7	86	90	88.3	91	84.5	90.5	91	88

Table 43: Nets ever treated (pre and/or post)  
Among total number of nets owned

	Site					Location				Urban/Rural		Socio-Economic Status					
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba- counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	649	53	65	265	80	186	24	181	164	280	205	444	144	160	123	107	115
Yes	30.2	22.6	30.8	38.1	48.7	12.9	29.2	35.4	28	28.2	34.6	28.2	23.6	31.2	28.5	28	40.9
No	69.8	77.4	69.2	61.9	51.3	87.1	70.8	64.6	72	71.8	65.4	71.8	76.4	68.8	71.5	72	59.1

Table 44: Ownership of pretreated mosquito nets  
Among total number of nets owned

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba- counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	649	53	65	265	80	186	24	181	164	280	205	444
Yes	17.9	22.6	21.5	17.7	38.8	6.5	29.2	27.1	23.2	7.9	27.3	13.5
No	79.4	67.9	76.9	80.4	60	90.3	62.5	71.3	70.1	91.4	70.2	83.6
Don't know	2.8	9.4	1.5	1.9	1.3	3.2	8.3	1.7	6.7	0.7	2.4	2.9

Table 45: Ownership of post-treated mosquito nets  
Among total number of nets owned

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba- counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	649	53	65	265	80	186	24	181	164	280	205	444
Yes	14.8	1.9	9.2	22.6	16.3	8.6	4.2	14.4	6.1	21.1	13.2	15.5
No	83.2	92.5	90.8	75.1	82.5	89.8	83.3	85.1	92.1	76.8	84.9	82.4
Don't know	2	5.7	0	2.3	1.3	1.6	12.5	0.6	1.8	2.1	2	2

Table 46: Treatment patterns  
Among total number of nets owned

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba- counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	649	53	65	265	80	186	24	181	164	280	205	444
Bought untreated and never treated	69.8	77.4	69.2	61.9	51.3	87.1	70.8	64.6	72	71.8	65.4	71.8
Bought pretreated and never treated	15.4	20.8	21.5	15.5	32.5	4.3	25	21	22	7.1	21.5	12.6
Bought pretreated and post-treated	2.5	1.9	0	2.3	6.3	2.2	4.2	6.1	1.2	0.7	5.9	0.9
Bought untreated and post-treated	12.3	0	9.2	20.4	10	6.5	0	8.3	4.9	20.4	7.3	14.6

Table 47: Average number of months ago net was last treated  
Among nets that were post-treated

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	96	1	6	60	13	16	1	26	10	59	27	69
1-2	27.1	0	83.3	18.3	69.2	6.3	0	38.5	60	16.9	37	23.2
3-4	21.9	0	16.7	13.3	15.4	62.5	0	30.8	20	18.6	29.6	18.8
5-6	4.2	0	0	3.3	0	12.5	0	3.8	0	5.1	3.7	4.3
7-8	5.2	0	0	6.7	7.7	0	0	3.8	0	6.8	3.7	5.8
9-10	5.2	0	0	8.3	0	0	0	3.8	0	6.8	3.7	5.8
11-12	18.8	0	0	28.3	7.7	0	0	0	20	27.1	0	26.1
13-18	0	0	0	0	0	0	0	0	0	0	0	0
19-24	1	0	0	1.7	0	0	0	0	0	1.7	0	1.4
25+	0	0	0	0	0	0	0	0	0	0	0	0
Average months ago	5.61	0	1.67	7.48	3	3.47	0	2.83	3.9	7.27	2.83	6.69
Don't know/don't recall	14.6	100	0	20	0	6.3	100	11.5	0	16.9	14.8	14.5

Table 48: Average number of times net was treated since purchase by age of net  
Among nets that were post-treated

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
All nets (n=96)	2.67	0	5	3	1.42	1.63	0	1.32	4.3	3	1.32	3.21
0 - <1 year (n=14)	1.29	0	0	1	2	1	0	1.33	0	1	1.33	1
1 - <2 years (n=30)	1.97	0	3	2.2	1	1	0	1	4	1.84	1	2.22
2 - <3 years (n=12)	1.70	0	0	1.67	2	0	0	2.33	2	1.33	2.33	1.43
3 - <4 years (n=10)	2.38	0	1	1.5	0	3	0	1	0	2.57	1	2.57
4 - <5 years (n=5)	2.00	0	3	1	0	1	0	0	2.33	1	0	2
5+ years (n=21)	5.89	0	17	5.28	0	0	0	0	17	5.28	0	5.89

Table 49: Product used to treat net  
Among nets that were post-treated

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	96	1	6	60	13	16	1	26	10	59	27	69
KO Tab	0	0	0	0	0	0	0	0	0	0	0	0
Powerchem	0	0	0	0	0	0	0	0	0	0	0	0
RAID product 1	0	0	0	0	0	0	0	0	0	0	0	0
RAID product 2	3.1	0	0	5	0	0	0	11.5	0	0	11.1	0
Other	6.3	100	0	6.7	7.7	0	100	3.8	0	6.8	7.4	5.8
Don't Know	90.6	0	100	88.3	92.3	100	0	84.6	100	93.2	81.5	94.2

Table 50: Place where insecticide treatment was obtained  
Among all nets that were post-treated

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	96	1	6	60	13	16	1	26	10	59	27	69
Market	3.1	0	0	5	0	0	0	11.5	0	0	11.1	0
Kiosk	0	0	0	0	0	0	0	0	0	0	0	0
Street vendor	0	0	0	0	0	0	0	0	0	0	0	0
General shop	2.1	100	0	0	7.7	0	100	3.8	0	0	7.4	0
Textile shop	0	0	0	0	0	0	0	0	0	0	0	0
Wholesaler	0	0	0	0	0	0	0	0	0	0	0	0
Pharmacy	0	0	0	0	0	0	0	0	0	0	0	0
Drug store	0	0	0	0	0	0	0	0	0	0	0	0
Supermarket	0	0	0	0	0	0	0	0	0	0	0	0
Project	0	0	0	0	0	0	0	0	0	0	0	0
Clinic	49	0	0	60	15.4	56.3	0	3.8	30	72.9	3.7	66.7
School	0	0	0	0	0	0	0	0	0	0	0	0
Gift	3.1	0	33.3	0	7.7	0	0	0	30	0	0	4.3
Employer	1	0	16.7	0	0	0	0	0	10	0	0	1.4
Hygiene services	21.9	0	16.7	8.3	61.5	43.8	0	76.9	10	0	74.1	1.4
Don't Know	19.8	0	33.3	26.7	7.7	0	0	3.8	20	27.1	3.7	26.1

Table 51: Type of source where insecticide treatment was obtained  
Among all nets that were post-treated

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>BASE</b>	96	1	6	60	13	16	1	26	10	59	27	69	24	30	16	7	19
Informal commercial source	3.1	0	0	5	0	0	0	11.5	0	0	11.1	0	0	0	0	0	15.8
Formal commercial source	24	100	16.7	8.3	69.2	43.8	100	80.8	10	0	81.5	1.4	4.2	10	12.5	42.9	73.7
Non-commercial source	50	0	16.7	60	15.4	56.3	0	3.8	40	72.9	3.7	68.1	62.5	73.3	43.8	28.6	10.5
Gift	3.1	0	33.3	0	7.7	0	0	0	30	0	0	4.3	0	0	18.8	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Don't Know	19.8	0	33.3	26.7	7.7	0	0	3.8	20	27.1	3.7	26.1	33.3	16.7	25	28.6	0

Table 52: Cost of insecticide treatment (XAF)  
Among nets that were post-treated

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	96	1	6	60	13	16	1	26	10	59	27	69
Average price	579.3	1200	0	439.9	842.9	964.3	1200	1300	450	335.8	1292.3	341.77
Standard Deviation	659.1	0	0	663	386.7	683.6	0	797.7	0	418.6	764.3	408.2
Trade/barter (%)	0	0	0	0	0	0	0	0	0	0	0	0
Free (%)	11.5	0	50	6.7	30.8	0	0	11.5	40	6.8	11.1	11.6
Don't Know/can't recall (%)	34.4	0	50	31.7	15.4	56.3	0	42.3	40	30.5	40.7	31.9

Table 53: Cost of insecticide treatment (USD)  
Among nets that were post-treated

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	96	1	6	60	13	16	1	26	10	59	27	69
Average price	0.74	1.53	0	0.56	1.08	1.23	1.53	1.66	0.57	0.43	1.65	0.44
Standard Deviation	0.84	0	0	0.85	0.5	0.87	0	1.02	0	0.53	0.97	0.52
Trade/barter (%)	0	0	0	0	0	0	0	0	0	0	0	0
Free (%)	11.5	0	50	6.7	30.8	0	0	11.5	40	6.8	11.1	11.6
Don't Know/can't recall (%)	34.4	0	50	31.7	15.4	56.3	0	42.3	40	30.5	40.7	31.9

Table 54: Number of times net washed since last (pre or post) treated  
Among all treated nets

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	196	12	20	101	39	24	7	64	46	79	71	125
0	44.4	75	45	33.7	38.5	83.3	57.1	68.8	34.8	29.1	67.6	31.2
1-2	12.2	0	15	7.9	30.8	4.2	0	15.6	17.4	7.6	14.1	11.2
3-4	1.5	0	5	2	0	0	0	0	0	3.8	0	2.4
5-6	2.6	8.3	0	4	0	0	14.3	0	0	5.1	1.4	3.2
7-8	2.6	0	0	5	0	0	0	0	0	6.3	0	4
9-10	1.5	0	0	3	0	0	0	0	0	3.8	0	2.4
11-12	1.5	0	0	3	0	0	0	0	0	3.8	0	2.4
13-18	0.5	0	0	0	2.6	0	0	1.6	0	0	1.4	0
19-24	0	0	0	0	0	0	0	0	0	0	0	0
25+	0.5	0	0	0	0	4.2	0	0	0	1.3	0	0.8
Average number of times (excluding 0)	5	6	2	5.8	2.15	19	6	2.55	1.38	7.2	2.83	5.79
Don't know/don't recall	32.7	16.7	35	41.6	28.2	8.3	28.6	14.1	47.8	39.2	15.5	42.4

## 4.7 APPROPRIATE USE

Although it is beneficial for any household member to sleep under a net, it is particularly important for those vulnerable to serious cases of malaria—children under five and pregnant women—to do so. This section reports on “appropriate use” of nets by looking at various measures of use by households, children under five, women of reproductive age, and pregnant women. Some of the measures use the household as the denominator (unit of analysis), while others use number of individuals in the vulnerable group as the denominator. Measures have been calculated to indicate use of any net, and then, specifically, use of a treated net.

The sample was limited to women of reproductive age (WRA)—age 15 to 49—so that net use by WRA could be calculated in addition to net use by pregnant women. The greatest public health impact is achieved when treated nets are used from the beginning of the pregnancy; however, many women do not realize they are pregnant, or do not wish to make their pregnancy public, for several months or more. Therefore, it is advisable for all women of reproductive age to sleep under treated nets nightly.

### Overall household use

There were a total of 7770 people in all households and 2682 in net-owning households sampled.

- Among 2682 people living in net-owning households, 46% had slept under a net the prior night. This represents 16% of all people living in the households sampled.
- Children under five and pregnant women were most likely to sleep under a net (although denominators for pregnant women are very small, making it difficult to draw definite conclusions); adult males and children over five were the least likely to sleep under a net.
- A higher proportion of adult females (50%) than adult males (39%) in net-owning households slept under a net.
- Fourteen percent (14%) of people in net-owning households slept under a *treated* net the prior night, representing 5% of all people living in households sampled.

### Use by children under age five

There were 1,811 children under age five in all households and 610 children under age five in net-owning household. (Note that in order to be included in the sample, a child aged 0-4 had to reside in the household.)

- Among the 610 children under five in net-owning households, 53% had slept under a net the prior night. This represents 18% of all children under five in the households in the sample.

- The proportions of children under five sleeping under nets in net-owning households was highest in Tambacounda site (57%) and lowest in Thies (39%) and Dakar (27%) sites. Children under five in far rural areas were more likely to sleep under a net (60%) than those residing in Dakar itself (24%) or other urban (50%) or rural areas (50%).
- Only 17% of children under five in net-owning households had slept under a *treated* net the prior night, representing 6% of all children under five in the households in the sample.
- Once a child reached age four, he or she became much less likely than younger children to sleep under a net, treated or not.
- The proportion of net-owning households where all children under five slept under a net (treated or untreated) the prior night decreased the more children the household had. For example, in only 21% of net-owning households with three or more children under five, all those children slept under a net the prior night, whereas in 65% of net-owning households with one child under five, that child slept under a net the night prior. Similarly, in only 5% of net-owning households with three or more children under five, all children under five slept under a *treated* net the night prior, whereas in 20% of net-owning households with one child under five that child slept under a *treated* net the prior night.

### Use by women of reproductive age and pregnant women

All households had at least one woman of reproductive age (WRA), since a criterion for selection was to be a WRA (age 15-49) with a child under five. The total number of WRA in the households sampled was 1,937. The number of women of reproductive age among net-owning households was 669. The total number of pregnant women in the households sampled was 117 and, of these, 42 were from net-owning households.

- Forty-nine percent (49%) of WRA in net-owning households slept under a net the prior night. This represents 17% of the total number of WRA in the households in the sample. Only 9% of WRA in net-owning households slept under a *treated* net the prior night. This represents 5% of the total number of WRA in the households in the sample.
- Pregnant women were more likely than any other family member to sleep under a net: 60% of pregnant women in net-owning households slept under a net the prior night. This represents 21% of the total number of pregnant women in the households in the sample. Only 17% of pregnant women in net-owning households slept under a *treated* net the prior night. This represents 6% of the total number of pregnant women in the households in the sample. (The denominators for pregnant women, however, were very small.)

### General patterns

- About 10% of nets had not been used the prior night.
- The average number of people sleeping under nets of different sizes was: king (2.44), double (1.89), and single (1.38).
- The average number of months people in the household slept under mosquito nets was 5.69 per year.

Table 55: Proportions of household members who slept under a net last night  
Among specific household members

	Household members in net-owning households			Household members in all households		
	Base	% sleeping under any net (n)	% sleeping under treated net (n)	Base	% sleeping under any net (n)	% sleeping under treated net (n)
<b>All</b>	2682	45.9% (1231)	14.2 (383)	7770	15.8% (1231)	4.9% (382)
<b>Adults (age 15+)</b>						
Males	499	39.3% (196)	11.4% (57)	1452	13.5% (196)	3.9% (57)
Females	771	49.9% (385)	15.3% (118)	2215	17.4% (385)	5.3% (118)
Females ages 15-49	669	48.9% (327)	15.2% (102)	1937	16.9% (327)	5.3% (102)
Pregnant women	42	59.5% (25)	16.7% (7)	117	21.4% (25)	6% (7)
<b>Older children (ages 5-14)</b>						
Males	383	42.8% (164)	13.6% (52)	1104	14.9% (164)	4.7% (52)
Females	419	39.6% (166)	12.2% (51)	1188	14% (166)	4.3% (51)
<b>Younger children (ages 0-4)</b>						
All	610	52.5% (320)	17% (104)	1811	17.7% (320)	5.7% (104)
Males	314	51.3% (161)	17.2% (54)	917	17.6% (161)	5.9% (54)
Females	296	53.7% (159)	16.9% (50)	894	17.8% (159)	5.6% (50)
Age 0	107	52.3% (56)	41.7% (18)	319	17.6% (56)	5.6% (18)
Age 1	96	56.3% (54)	16.7% (16)	281	19.2% (54)	5.7% (16)
Age 2	142	54.9% (78)	19% (27)	406	19.2% (78)	6.7% (27)
Age 3	134	53% (71)	22.4% (30)	412	17.2% (71)	7.3% (30)
Age 4	131	46.6% (61)	9.9% (13)	393	15.5% (61)	3.3% (13)

Table 56: Proportions of vulnerable groups who slept under net last night  
Among persons most vulnerable to severe malaria in net-owning households

	Total	Site					Location				Urban/Rural		Socio-Economic Status				
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
<b>Children (0-4)</b>																	
Any net (n=320)	52.5	26.9	39.3	68.9	43	57.1	24.1	50	50	59.6	46.1	55.4	57.4	60.9	38.3	54.3	50.5
Treated net (n=104)	17	7.5	13.1	28.8	21	8.8	3.4	18.9	17	17.4	16.6	17.3	10.1	20.5	15.8	16.3	22.9
<b>Females (15-49)</b>																	
Any net (n=327)	48.9	18.9	37	65.8	42.5	51.8	18.6	45.1	46.8	58.8	40.3	53.6	65.1	50.9	44.8	45.8	37.7
Treated net (n=102)	15.2	2.2	13.6	25.4	19.8	6.1	2.3	16.4	13.4	18	13.9	16	16.7	17.4	14.2	12.7	14.6
<b>Pregnant Women</b>																	
Any net (n=25)	59.5	33.3	20	71.4	66.7	64.3	50	43.8	64.3	80	44.4	70.8	75	50	66.7	75	36.4
Treated net (n=7)	16.7	33.3	0	21.4	33.3	7.1	50	18.8	14.3	10	22.2	12.5	12.5	0	22.2	12.5	27.3

Table 57: Proportion of net-owning households in which none, some, or all children under five slept under a net last night  
Among net-owning households with children under age five

	% Sleeping under any net			% Sleeping under treated net		
	None	Some	All	None	Some	All
<b>Number of net-owning households with 1, 2 or 3+ children under age 5</b>						
1 (n=113)	35.4	---	64.6	79.6	---	20.4
2 (n=123)	30.9	18.7	50.4	78.0	7.3	14.6
3+ (n=97)	32.0	47.4	20.6	75.3	19.6	5.2

Table 58: Mean number of people sleeping under a net, by net size  
Among household members sleeping under specific size nets

	Size of net		
	King	Double	Single
<b>BASE</b>	288	278	57
None (%)	9.7	10.1	7.0
Mean (excluding zero)	2.44	1.89	1.38
Standard deviation	0.89	0.73	0.66
Median value	1.95	1.38	1.0

Table 59: Number of months per year people in household sleep under a net  
Among net-owning households

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	336	37	41	111	50	97	16	99	92	129	115	221
Mean no. of months	5.69	6.17	4.56	6.76	5.1	5.04	5.8	5.63	4.93	6.27	5.65	5.71
Standard deviation	3.53	4.02	2.96	3.94	3.45	2.7	4.07	3.58	2.86	3.78	3.63	3.48
None (%)	1.8	5.4	4.9	0	2	1	6.3	3	0	1.6	3.5	0.9

## 4.8 CONSUMER MOSQUITO NET PREFERENCES

The prior section described the characteristics of nets owned, which is to a large extent a reflection of types of nets currently available. This section reports on the characteristics of nets that consumers *prefer*. Questions on net preferences were asked of all respondents, whether or not the household owned a net. The information in this section will be used to develop nets with features that consumers want.

### Net shape and size preferences

- Over half of the respondents (54%) preferred round/conical nets, and 38% preferred rectangular nets. Fewer respondents preferred wedge (4%) or triangle/pyramid (4%) shaped nets.
- Consumers preferred large nets. Eighty percent (80%) of the households preferred king-size nets for their households and 12% preferred double-size nets. Only 5% preferred cot-size nets and 3% single-size nets.

Table 60: Net shape preferences  
Among all respondents

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
Rectangular	37.8	38.5	42.2	45.3	28.3	34.5	43.5	40.6	34.9	36.1	41.3	35.5
Round/conical	53.5	53.2	47.2	46.8	65.7	54.8	50.6	53.7	53.8	53.8	53	53.8
Triangle/pyramid	3.5	1.5	4	4.5	3	4.6	1.2	2.5	4.3	4.3	2.3	4.3
Wedge	3.9	5.9	5	2.5	2	4.1	3.5	2.9	5	4	3	4.5
Any other	0.7	1	0.5	1	0.5	0.5	1.2	0.3	0.3	1.3	0.5	0.8
No preference	0.6	0	1	0	0.5	1.5	0	0	1.7	0.3	0	1

Table 61: Net size preferences  
Among all respondents

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
Cot-net	5.1	5.9	6.5	3.5	4	5.6	5.9	5.1	3.3	6.7	5.3	5
Single	3.2	5.9	3.5	0	3.5	3	8.2	2.9	1.7	3.7	4	2.7
Double	11.7	12.2	13.6	13.9	8.6	10.2	10.6	13.3	12.6	9.4	12.8	11
King	79.9	76.1	76.4	82.6	83.3	81.2	75.3	78.7	82.1	80.3	78	81.2
No preference	0.1	0	0	0	0.5	0	0	0	0.3	0	0	0.2

## Net color preferences

- The net colors preferred most by respondents were white (29%), dark blue (19%), pink (18%), and light blue (17%). Thirty-six percent (36%) of respondents reported disliking black colored nets, 19% disliked dark green, 17% white, 10% pink, and 9% light green nets.

Table 62: Net color preferences  
Among all respondents

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
White	28.6	37.6	22.1	31.8	26.3	24.9	40	30.2	24.6	27.8	32.3	26.2
Light blue	16.5	17.6	15.1	19.4	12.6	17.8	20	16.5	20.3	11.7	17.3	16
Dark blue	18.5	13.2	19.1	15.9	24.7	19.8	11.8	17.1	18.9	21.4	16	20.2
Light green	7.4	5.4	11.6	7.5	5.6	7.1	5.9	4.4	8	10.4	4.8	9.2
Dark green	3.1	2.9	4	1.5	2.5	4.6	2.4	2.9	3.7	3	2.8	3.3
Pink	17.8	15.1	20.1	17.9	20.2	15.7	12.9	21.3	15.9	17.4	19.5	16.7
Black	7.7	8.3	7.5	6	7.6	9.1	7.1	7	8.3	8	7	8.2
No preference/don't know	0.4	0	0.5	0	0.5	1	0	0.6	0.3	0.3	0.5	0.3

Table 63: Net color dislikes  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
White	17	15.1	19.1	16.9	14.1	19.8	14.1	17.8	15.6	18.4	17	17
Light blue	3.6	4.4	5	4.5	2.5	1.5	3.5	3.5	4	3.3	3.5	3.7
Dark blue	13.9	20.5	13.6	16.4	13.1	5.6	23.5	14.9	13	11	16.8	12
Light green	8.9	16.6	9.5	9	4.5	4.6	18.8	9.2	8.3	6.4	11.3	7.3
Dark green	18.9	22.9	21.1	22.9	14.1	13.2	24.7	17.8	20.3	17.1	19.3	18.7
Pink	9.9	13.2	13.1	11.9	3.5	7.6	10.6	9.8	10.3	9.4	10	9.8
Black	36.2	43.4	38.2	44.3	32.3	22.3	43.5	38.4	31.9	36.1	39.5	34
None/don't know	32	26.8	23.6	25.4	37.4	47.2	21.2	27.6	39.2	32.4	26.3	35.8

## SECTION 5

### OTHER MOSQUITO CONTROL PRODUCTS

In order to understand the role of nets in the larger context of mosquito control products, respondents were asked what mosquito control methods they knew of and used, what attributes of mosquito control they valued the most, and what products and brands they associated with various attributes. This information will be particularly useful for the private sector as it seeks to meet consumer needs.

#### 5.1 AWARENESS OF MOSQUITO CONTROL PRODUCTS AND METHODS

- The commercial insect control product respondents were most aware of (unprompted mention) was the mosquito net (85%): 62% mentioned sleeping under a net and 22% specifically mentioned a treated net. The other commonly mentioned products were mosquito coils (85%) and aerosol insecticide (80%).
- Mention of mosquito nets was highest in Tambacounda (95%) and lowest in Dakar (62%).
- A variety of non-commercial methods of mosquito control were mentioned, the most common of which was “keeping surroundings clean” mentioned by 18% of respondents.

Table 64: Awareness of mosquito control products and methods  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tambacounda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
<b>COMMERCIAL PRODUCTS:</b>												
Sleep under a mosquito net (untreated or unspecified)	62.4	45.4	58.3	73.6	58.1	77.2	49.4	67.3	55.8	67.6	63.5	61.7
Sleep under an insecticide-treated mosquito net	22.1	16.6	18.6	40.8	16.7	17.8	29.4	27	15.6	21.4	27.5	18.5
Use mosquito coils	84.7	80.5	89.4	81.1	82.3	90.4	77.6	85.7	84.4	86	84	85.2
Use aerosol insecticide	80.4	85.4	83.4	83.6	68.2	81.2	89.4	88.3	76.7	73.2	88.5	75
Use commercial mosquito repellent on body	0.1	0	0	0.5	0	0	0	0.3	0	0	0.3	0
Use flit gun/spray gun (that you fill yourself)	4.8	5.9	4	5.5	6.6	2	5.9	5.7	3.3	5	5.8	4.2
Have mosquito screens/nets in windows/doors	5.5	7.3	10.6	7.5	1	1	17.6	11.1	1	0.7	12.5	0.8
<b>OTHER:</b>												
Incense sticks	18.1	13.2	27.1	22.4	18.7	9.1	9.4	21	20.9	14.7	18.5	17.8
Vapor tablets	9	16.6	13.1	11.4	2	1.5	15.3	8.3	9.6	7.4	9.8	8.5
Kerosene	1.7	0.5	0.5	0	7.6	0	0	2.5	2	1	2	1.5
Insecticide	1.5	1	1	2	3.5	0	2.4	1.6	1.7	1	1.8	1.3
Electric fan/hand held fan	1.3	1	3.5	0	1.5	0.5	2.4	1.6	1.7	0.3	1.8	1
Eucalyptus	0.5	1	1	0	0.5	0	2.4	0	1	0	0.5	0.5
Add chlorine to drinking water	0.1	0.5	0	0	0	0	0	0	0	0.3	0	0.2
Other commercial products	0.6	0.5	0.5	1	0.5	0.5	1.2	0.3	1	0.3	0.5	0.7
<b>NON-COMMERCIAL METHODS:</b>												
Close windows and doors	12.8	11.2	14.1	4	10.6	24.4	5.9	18.1	9	13	15.5	11
Burn things	0.7	0.5	0	0.5	1	1.5	0	1	0.7	0.7	0.8	0.7
Tree bark	5.2	0.5	0.5	0	21.2	4.1	1.2	5.7	5.6	5.4	4.8	5.5
Cover body with cloth while sleeping	0.1	0	0.5	0	0	0	0	0	0.3	0	0	0.2
Keep surroundings clean	17.5	14.6	22.6	11.4	17.2	21.8	14.1	23.5	13	16.7	21.5	14.8
Other non-commercial methods (Unspecified)	13.3	14.6	14.1	10	19.2	8.6	15.3	11.7	14	13.7	12.5	13.8

## 5.2 USE OF COMMERCIAL MOSQUITO CONTROL PRODUCTS

If a respondent was aware of a given mosquito control method, she was asked whether she had used that method in the prior year. Note that these figures may be lower than actual use, given that “use” was asked only of those who indicated that they were aware of a given product, and level of use was calculated using total number of respondents as the base. Note also that use of nets is covered in Section 4.

- The commercial mosquito control products respondents most often reported having used in the last 12 months were mosquito coils (61%) and aerosol insecticides (54%). Use of aerosols was higher in urban areas whereas use of coils and mosquito nets was higher in rural areas. (Net use is covered in Section 4.)

Table 65: Use of commercial mosquito control products  
Among all respondents (Multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
Use mosquito coils	61.1	60	58.3	48.8	63.1	75.6	51.8	61.3	67.4	57.2	59.3	62.3
Use aerosol insecticide	53.5	67.8	53.3	48.8	46.5	50.8	68.2	65.4	53.2	37.1	66	45.2
Use commercial mosquito repellent on body	1.6	3.9	0.5	0.5	1	2	8.2	2.2	0.3	0.3	3.5	0.3
Use flit gun/spray gun (that you fill yourself)	2.7	2	1.5	3.5	6.6	0	2.4	4.4	2	1.7	4	1.8
Have mosquito screens/nets in windows/doors	2.8	4.9	4	5	0	0	11.8	4.8	1	0	6.3	0.5
Other commercial method	35.8	31.2	42.7	29.4	59.1	16.8	29.4	41	38.9	29.1	38.5	34

## 5.3 FREQUENCY, LOCATION AND PRICE OF COIL, INSECTICIDE AEROSOL, AND REPELLANT PURCHASES

### Coils

- Households buy mosquito coils very frequently. Of the 61% of households that had purchased mosquito coils in the last 12 months, 72% reported that they bought them within the last week.
- The average reported price paid for a single mosquito coil was 0.07 USD. The reported price was stable across sites and between urban and rural areas.
- Almost all households (93%) that purchased coils bought them in a general shop.

Table 66: Frequency of mosquito coil purchase  
Among households that used mosquito coils in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	611	123	116	98	125	149	44	193	203	171	237	374
Today or yesterday	39.9	36.6	40.5	34.7	34.4	50.3	25	55.4	35	32.2	49.8	33.7
Within the last 7 days	31.9	37.4	24.1	29.6	35.2	32.2	31.8	28.5	35	32.2	29.1	33.7
Within the last month	17.0	13.8	20.7	22.4	18.4	12.1	15.9	9.8	19.7	22.2	11	20.9
Within the last 3 months	6.2	4.9	10.3	7.1	8.8	1.3	9.1	4.1	5.4	8.8	5.1	7
More than 3 months ago	3.8	4.9	4.3	6.1	2.4	2	11.4	2.1	3.9	3.5	3.8	3.7
Don't know/can't recall	1.1	2.4	0	0	0.8	2	6.8	0	1	1.2	1.3	1.1

Table 67: Average price of single mosquito coil (USD)  
Among households that bought a single mosquito coil

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	443	85	94	57	94	113	19	143	159	122	162	281
Average price	0.07	0.07	0.07	0.08	0.07	0.08	0.08	0.08	0.07	0.08	0.08	0.07
Standard Deviation	0.02	0.01	0.01	0.02	0.03	0.02	0.01	0.02	0.01	0.02	0.02	0.02
Median value	0.06	0.06	0.07	0.07	0.06	0.07	0.07	0.07	0.06	0.06	0.07	0.06
Don't Know	1.4	1.2	2.1	3.5	1.1	0	5.3	0.7	1.3	1.6	1.2	1.4

Table 68: Place where mosquito coils were purchased  
Among households that used mosquito coils in the 12 months before the interview

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	611	123	116	98	125	149	44	193	203	171	237	374
Market	2.9	1.6	2.6	1	6.4	2.7	4.5	2.1	2.5	4.1	2.5	3.2
Kiosk	0	0	0	0	0	0	0	0	0	0	0	0
Street vendor	2.1	0	0	1	0	8.1	0	1	3	2.9	0.8	2.9
General shop	92.8	96.7	97.4	90.8	92	87.9	90.9	94.8	93.6	90.1	94.1	92
Wholesaler	0.5	0	0	2	0.8	0	0	0.5	1	0	0.4	0.5
Pharmacy	0	0	0	0	0	0	0	0	0	0	0	0
Drugstore	0	0	0	0	0	0	0	0	0	0	0	0
Supermarket	0	0	0	0	0	0	0	0	0	0	0	0
Mini-mart	0.2	0	0	0	0.8	0	0	0.5	0	0	0.4	0
Hawkers/moving kiosk	0.2	0.8	0	0	0	0	2.3	0	0	0	0.4	0
Organizations	0.2	0	0	1	0	0	0	0.5	0	0	0.4	0
Don't Know	0.8	0.8	0	2	0	1.3	2.3	0.5	0	1.8	0.8	0.8

## Aerosols

- Of the 54% of households that had purchased aerosols in the last 12 months, 75% had purchased them within the last month.
- The average reported price paid for a 180-220 ml can of aerosol insecticide was 1.37 USD, but was higher in urban (1.54 USD) than rural (1.19 USD) areas. The average reported price paid for a 300-350 ml can of aerosol insecticide was 1.85 USD.
- The majority (71%) of households that had purchased aerosols purchased them in a general shop. Aerosols were not commonly purchased in markets (6%) (except for Kaolack where 20% of households purchased them in a market), mini-marts (5%), supermarkets (1%), or kiosks (0.4%).

Table 69: Frequency of aerosol insecticide purchase  
Among households that used aerosol insecticides in the 12 months before the interview

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	535	139	106	98	92	100	58	206	160	111	264	271
Today or yesterday	5.8	5	6.6	1	14.1	3	6.9	5.8	7.5	2.7	6.1	5.5
Within the last 7 days	20.4	24.5	9.4	26.5	16.3	24	22.4	23.3	18.8	16.2	23.1	17.7
Within the last month	49	45.3	60.4	50	33.7	55	39.7	58.3	41.9	46.8	54.2	43.9
Within the last 3 months	11.4	5.8	12.3	7.1	28.3	7	8.6	8.3	15	13.5	8.3	14.4
More than 3 months ago	11	14.4	9.4	14.3	6.5	9	17.2	3.9	13.8	17.1	6.8	15.1
Don't know/can't recall	2.4	5	1.9	1	1.1	2	5.2	0.5	3.1	3.6	1.5	3.3

Table 70: Average price of 180-220 ml can of aerosol insecticide (USD)  
Among households that bought a 180-220 ml can of aerosol insecticide

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	133	36	23	17	32	25	13	49	44	27	62	71
Average price	1.37	1.22	1.38	1.52	1.64	1.17	1.5	1.55	1.2	1.17	1.54	1.19
Standard Deviation	0.61	0.47	0.24	0.57	1.07	0.36	0.65	0.74	0.38	0.43	0.72	0.39
Median value	1.21	1.21	1.26	1.31	1.25	1.15	1.6	1.35	1.16	1.05	1.35	1.14
Don't Know	33.1	38.9	8.7	23.5	46.9	36	53.8	18.4	45.5	29.6	25.8	39.4

Table 71: Average price of 300-350 ml can of aerosol insecticide (USD)  
Among households that bought a 300-350 ml can of aerosol insecticide

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	180	52	32	32	35	29	22	73	46	39	95	85
Average price	1.85	1.89	1.97	1.88	1.64	1.84	1.93	1.89	1.73	1.89	1.9	1.8
Standard Deviation	0.48	0.57	0.31	0.51	0.46	0.44	0.43	0.44	0.49	0.58	0.43	0.53
Median value	1.88	1.9	1.91	1.77	1.63	1.84	2.01	1.88	1.72	1.87	1.89	1.87
Don't Know	20.6	21.2	15.6	9.4	34.3	20.7	22.7	12.3	23.9	30.8	14.7	27.1

Table 72: Place where aerosol insecticides were purchased  
Among households that used aerosol insecticides in the 12 months before the interview

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	535	139	106	98	92	100	58	206	160	111	264	271
Market	6	2.2	0	4.1	19.6	7	5.2	5.8	5	8.1	5.7	6.3
Kiosk	0.4	0	0.9	0	0	1	0	0	1.3	0	0	0.7
Street vendor	0.4	1.4	0	0	0	0	1.7	0	0	0.9	0.4	0.4
General shop	70.5	74.1	75.5	77.6	51.1	71	62.1	75.7	71.3	64	72.7	68.3
Wholesaler	2.4	2.9	0.9	5.1	3.3	0	1.7	1.9	1.9	4.5	1.9	3
Pharmacy	0	0	0	0	0	0	0	0	0	0	0	0
Drugstore	0	0	0	0	0	0	0	0	0	0	0	0
Supermarket	1.1	2.2	1.9	0	0	1	5.2	1.5	0	0	2.3	0
Mini-mart	5.2	5.8	3.8	6.1	7.6	3	10.3	6.8	3.1	2.7	7.6	3
Hawkers/moving kiosk	0.6	1.4	0	0	1.1	0	3.4	0.5	0	0	1.1	0
Organizations	0.6	0.7	0	1	0	1	1.7	0.5	0.6	0	0.8	0.4
Bought abroad	0.4	0	1.9	0	0	0	0	0	1.3	0	0	0.7
Bought from relative/neighbor	0.2	0	0.9	0	0	0	0	0	0.6	0	0	0.4
Other	1.3	0.7	2.8	3.1	0	0	1.7	1.5	0	2.7	1.5	1.1
Don't Know	11	8.6	11.3	3.1	17.4	16	6.9	5.8	15	17.1	6.1	15.9

## Repellants

- Repellants were not commonly purchased or used by respondents. The number of people purchasing repellants and recalling place and date of purchase and price was too small to permit meaningful calculations for these variables.

## 5.4 PERCEPTIONS OF MOSQUITO CONTROL ATTRIBUTES, PRODUCTS, AND BRANDS

### Valued attributes of mosquito control products

Respondents were to read a list of attributes of mosquito control products and asked to rate, on a scale of 1-7, how important to them various attributes were.

- Most attributes named were considered important. “Kills mosquitoes” (6.76) was rated as the most important attribute; the next most highly rated were “kills other insects, other than mosquitoes” (6.57), “reduces malaria” (6.51), “is safe to use around children” (6.28), and “is a long-term solution to mosquito problems” (6.19).

Table 73: Mean rating of mosquito control product attributes  
Among all households

	Site					Location				Urban/Rural		
	Total	Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
Kills mosquitoes	6.76	6.57	6.84	6.61	6.89	6.87	6.65	6.79	6.77	6.73	6.76	6.75
Keeps mosquitoes away for a long time	4.65	4.55	4.93	4.2	4.21	5.37	4.94	4.36	4.46	5.06	4.49	4.76
Keeps mosquitoes away while sleeping	5.54	5.12	5.79	5.33	5.69	5.78	5.6	5.65	5.4	5.55	5.64	5.47
Kills other insects, other than mosquitoes	6.57	6.54	6.49	6.61	6.83	6.41	6.61	6.64	6.63	6.43	6.64	6.53
Is safe to use around children	6.28	6.18	6.56	6.33	6.59	5.72	6.36	6.32	6.33	6.14	6.33	6.24
Is a good value for the money	5.82	6.03	6.07	5.82	5.84	5.3	6.06	5.84	5.85	5.69	5.89	5.77
Is a long-term solution to mosquito problems	6.19	6.18	6.48	5.94	6.56	5.79	6.22	6.36	6.14	6.04	6.33	6.09
Is a high quality and effective brand	5.62	5.71	5.95	5.47	5.42	5.56	6	6.01	5.4	5.34	6.01	5.37
Reduces malaria	6.51	6.4	6.67	6.41	6.8	6.28	6.49	6.6	6.54	6.39	6.58	6.47

### Association of attributes with mosquito control products

Respondents were read a list of attributes and asked which type(s) of mosquito control product they thought of when they heard each attribute. They could indicate more than one product. (Note that the base is respondents who were aware of products when prompted, and the table indicates the percentage of those respondents selecting a given product when a particular attribute was named.)

- Ratings for mosquito nets far exceeded all other products on “safe to use around children”(89%), “reduces malaria” (83%), “long-term solution to mosquito problems” (78%), “keeps mosquitoes away while sleeping” (71%), and “is a good value for the money” (64%). Nets were not associated with killing mosquitoes (11%) or with killing other insects (8%).
- Sprays/aerosols were the product most associated with “kills mosquitoes” (92%), “kills other insects, other than mosquitoes” (91%), and “is a high quality/effective brand” (60%).

Table 74: Association of mosquito control products and attributes  
Among respondents who are aware of specific mosquito control products

	Mosquito coil	Sprays/Aerosol	Repellant	Mosquito net	Window/door screens	None	Don't Know
<b>BASE</b>	991	972	251	955	505	1000	1000
Kills mosquitoes	30.9	91.9	15.1	10.6	2.6	2.5	1.8
Keeps mosquitoes away for a long time	79.8	29.8	34.7	42.4	27.1	0.4	0.9
Keeps mosquitoes away while sleeping	55.2	33.7	37.8	70.8	30.9	0.3	0.8
Kills other insects, other than mosquitoes	14.6	91.2	7.2	7.9	1.2	3.2	2.1
Is safe to use around children	24.9	20.7	29.9	89.1	55.6	2.0	1.3
Is a good value for the money	43.2	47.7	25.9	64.0	25.9	1.7	4.5
Is a long-term solution to mosquito problems	22.0	42.1	13.5	78.3	38.0	4.0	3.2
Is a high quality/effective brand	22.9	60.3	24.3	48.1	12.9	2.8	7.1
Reduces malaria	46.0	59.7	37.8	83.0	45.7	1.9	3.1

## Awareness of mosquito control brands

Respondents were asked to name the brands of mosquito control products they were aware of, even if they did not use them. After providing their responses, they were shown a card with the name and logo of different brand names and were asked to indicate which other brand names, apart from the ones they already mentioned, they were aware of. The following tables show respondent awareness by unprompted, prompted, and total awareness.

- Spontaneous (unprompted) awareness was highest for Yotox (71%), Baygon (36%), and Elf (35%).
- Additional level of brand name awareness when prompted with a show card was: Baygon (40%), Raid (32%), Elf (30%), and Yotox (22%).
- Total awareness, as calculated by the sum of unprompted and prompted responses, was highest for Yotox (93%), Baygon (77%), and Elf (66%). Forty-eight percent (48%) of respondents were aware of the Raid brand name. There was virtually no awareness of Cock (5%) or Doom (0%).
- Overall, awareness of brands was higher in urban than in rural areas.

Table 75: Awareness of mosquito control product brand names, unprompted  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
Baygon	36.3	40.0	24.1	33.3	46.5	37.6	40	49.2	32.2	25.8	47.3	29
Cock	0.6	1	0	0	0	2	1.2	0	1.3	0.3	0.3	0.8
Doom	0.3	0.5	1	0	0	0	0	0.6	0.3	0	0.5	0.2
Elf	35.4	57.1	35.2	34.8	35.9	13.2	63.5	44.1	33.2	20.4	48.3	26.8
Raid	16	32.7	18.1	10.9	8.1	9.6	43.5	17.8	13.6	8.7	23.3	11.2
Yotox	70.7	77.6	65.3	67.2	69.2	74.1	81.2	78.4	65.1	65.2	79	65.2
Other	5	7.8	3	6.5	5.6	2	11.8	5.4	4.3	3.3	6.8	3.8

Table 76: Awareness of mosquito control product brand names, prompted  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
Baygon	40.2	41.5	49.7	41.8	37.9	29.9	38.8	41	41.2	38.8	40.5	40
Cock	4.5	2.0	1.5	3.0	7.1	9.1	3.5	7.3	3.7	2.7	6.5	3.2
Elf	30.3	25.9	31.2	31.8	26.8	36	17.6	34.6	29.9	29.8	31	29.8
Raid	32.1	38.0	35.7	30.3	27.8	28.4	36.5	39.7	26.6	28.4	39	27.5
Yotox	22.4	18.0	26.6	23.9	26.3	17.3	14.1	17.5	26.6	25.8	16.8	26.2

Table 77: Awareness of mosquito control product brand names, total  
Among all respondents (multiple responses possible)

	Total	Site					Location				Urban/Rural	
		Dakar	Thies	St. Louis	Kaolack	Tamba-counda	Dakar Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
<b>BASE</b>	1000	205	199	201	198	197	85	315	301	299	400	600
Baygon	76.5	81.5	73.9	75.1	84.3	67.5	78.8	90.2	73.4	64.5	87.8	69
Cock	5.1	2.9	1.5	3.0	7.1	11.2	4.7	7.3	5	3	6.8	4
Doom	0.3	0.5	1	0	0	0	0	0.6	0.3	0	0.5	0.2
Elf	65.7	82.9	66.3	66.7	62.6	49.2	81.2	78.7	63.1	50.2	79.3	56.7
Raid	48.1	70.7	53.8	41.3	35.9	38.1	80	57.5	40.2	37.1	62.3	38.7
Yotox	93.1	95.6	92	91	95.5	91.4	95.3	95.9	91.7	91	95.8	91.3

## Mosquito control brand name associations

Respondents were read a series of attributes and asked to indicate which brand(s) they associated with the attribute. The following table provides attributes by total (sum of unprompted and prompted) awareness.

- Yotox, the most commonly recognized brand, had the highest ratings (total) for “kills mosquitoes” (76%), “reduces malaria” (73%), and “is a good value for the money” (59%). Baygon had the highest ratings for “kills other insects, other than mosquitoes” (70%), and Elf for “is a long-term solution to mosquito problems” (52%). (Doom was recognized by only three respondents, so ratings are not meaningful.) Although Raid ranked high on some of the mosquito control attributes, it did not rank the highest on any attribute.
- All brands were ranked low on “is safe to use around children.”

**Table 78: Mosquito control product attribute and brand name association, total**

Among respondents who were aware (spontaneous and prompted) of specific mosquito control product brand names

	Baygon	Cock	Doom	Elf	Raid	Yotox	None	Don't know
<b>BASE</b>	765	51	3	657	481	931	1000	1000
Kills mosquitoes	71.5	37.3	33.3	72	62.4	76.3	2.7	1.9
Keeps mosquitoes away for a long time	43.4	62.7	66.7	45.8	32.2	60.7	14.7	3.7
Keeps mosquitoes away while sleeping	49.9	54.9	66.7	56.5	33.1	64.3	11.6	2.7
Kills other insects, other than mosquitoes	70.3	25.5	0	63.6	56.5	58.1	2.3	2.5
Is safe to use around children	19.5	31.4	0	32.4	22.9	36.6	37.5	8.7
Is a good value for the money	40.1	31.4	33.3	58.1	38.0	59.2	6.8	8.3
Is a long-term solution to mosquito problems	47.3	23.5	33.3	52.1	37.6	50.2	17.0	8.0
Is a high quality/effective brand	39.6	23.5	33.3	57.8	35.8	55.3	3.5	7.4
Reduces malaria	65.2	51.0	66.7	68.3	56.8	72.5	5.1	5.3

## SECTION 6

### PROGRAM/PRODUCT IMPLICATIONS

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#### 6.1 GENERAL

There are many very favorable aspects for ITM promotion in Senegal, as well as some barriers to be overcome.

The favorable factors for ITM promotion are:

- High awareness of malaria and general understanding that mosquitoes cause malaria; high levels of knowledge of groups most vulnerable to severe malaria
- Common use and relatively frequent purchase of mosquito control products (including aerosol sprays, which are comparatively expensive)
- Nets viewed extremely positively — more positively than any other insect control product (except that aerosols perceived as doing a better job of killing mosquitoes and other insects)
- Evidence of higher net coverage rates where they have been promoted
- A nascent “net culture”; about one-third of all households already own at least one net and almost half of nets were acquired in the last two years
- Reasonable access to nets; for many consumers time to nearest purchase site is not long
- Already moderate level of ITM awareness
- Strong valuing of the product attributes that *insecticide treated nets* deliver (e.g., killing mosquitoes; killing other insects other than mosquitoes)
- High level of perceived advantages and low level of perceived disadvantages of nightly use of treated nets by vulnerable groups

Important barriers to overcome for ITM promotion are:

- Perceived high cost of nets and perception that they are not affordable
- Fairly large proportion of nets are being provided by public sector and through the commercial sector on a subsidized basis — people are used to getting nets for little or no money
- Lack of variety in net size, color, and shape among available nets
- Concerns about safety and potential adverse health effects of insecticide treatments, particularly with regard to young children and pregnant women
- Little availability of insecticide treatments through commercial sector
- Lack of strong branding of nets and insecticide treatments
- Low rates of net treatment /re-treatment
- Erroneous beliefs about non-mosquito related causes of malaria
- Inadequate use of ITMs by young children and pregnant women
- Use of nets only part of the year
- A specialized insect control product market in which nets and other insect control products are sold in different outlets

The majority of findings from this baseline study are consistent with results of NetMark’s formative qualitative research in Senegal. The qualitative research report, “NetMark Formative Qualitative Research on ITMs in Senegal” contains more detailed information on a number of topics discussed here and is available from NetMark.

Specific program and product implications from the baseline study presented in this report are outlined below.

## 6.2 KNOWLEDGE AND BELIEFS ABOUT MALARIA AND MOSQUITOES

- Recognition of the French term “paludisme” or “palu” was high, demonstrating that the term can be used in health promotion activities and will be widely understood. Use of a single term around which educational efforts can build a common understanding will be very important in efforts to promote behavior change. Symptoms associated with “paludisme/palu” were generally consonant with the biomedical definition of the term, indicating that identification of the illness is already good, and little time needs to be spent on educating people to recognize signs. The only exception is low mention of convulsions, a symptom of severe malaria; there is need to link convulsions to malaria in public education efforts.
- Despite the fact that a high percentage of respondents knew that mosquitoes cause malaria, most people erroneously believed that there were other causes of malaria as well, especially living in dirty surroundings or near standing water, getting hot/sun overexposure, and being in the rain. Malaria prevention efforts should emphasize that mosquitoes are the *only* cause of malaria, dispel erroneous beliefs about other causes, and stress that environmental management measures (such as reducing amounts of standing water) can help reduce nuisance biting by mosquitoes that do not carry the malaria parasite but do not reduce malaria. It would also be important to convey the fact that night-biting mosquitoes are the ones that transmit malaria.
- Knowledge of the groups most vulnerable to severe cases of malaria was good. Efforts to promote ITM acquisition and proper use can build on the existing perception that children are particularly vulnerable, but must emphasize the special vulnerability of children *under five* and pregnant women to suffering severe consequences of malaria.
- Exposure to information about malaria prevention was quite high, even in rural areas. Information was being transmitted largely through mass media (radio and TV), health facilities, and friends or relatives. The accuracy of information transmitted by friends/relatives is unknown. Increased exposure to accurate malaria prevention messages is still needed. A coordinated strategy that provides information from a variety of media and interpersonal sources is likely to be effective.

## 6.3 MOSQUITO NETS

### Perceived advantages and disadvantages of treated/untreated net use by vulnerable groups

- Virtually all respondents perceived advantages of net/ITN use by vulnerable groups — children under five and pregnant women. Promotional efforts designed to achieve nightly or year round net use by these groups can build on respondents’ perceptions that nets provide good protection against mosquitoes, other insects, and malaria.
- *Treated* nets were seen as especially effective in providing good protection against mosquitoes and malaria, with the added advantage of killing and repelling mosquitoes. Owners were more likely to see these advantages than non-owners. Treated nets should be marketed as having these added advantages that consumers already like, as this will be a likely motivator to their use. Since net treatments are not visible, and people do not expect nets to have insecticide properties, it will be important to find strategies for product trials — possibly among opinion leaders — so that consumers see that treated nets deliver what they most want in a mosquito control product.
- Few respondents cited any disadvantages of a child under five sleeping under a net, but among those who did, the main disadvantages were that the child might get caught/trapped or suffocate and that it is hot sleeping under a net. These perceived disadvantages should be addressed in promotional activities as well as in product formulation. However, product modification should be addressed in light of any cost increases they would involve.

- Respondents cited stronger disadvantages of *treated* nets, voicing concern about the noxious smell and potential danger of the insecticide to young children and pregnant women. Negative perceptions of treated nets appear to be based on previous experience with aerosols and coils (e.g., smell, irritation, and adverse health effects). Since smell and irritation are mild and transient in treated nets, negative perceptions are likely to be overcome when products are actually used. Promotional strategies should emphasize opportunities for product trial. In addition, IEC messages and product development should take into account consumer concerns about smell and safety. At the same time, since the smell of the insecticide dissipates shortly after treatment, consumers may think that the insecticide is no longer effective; some means should be found to indicate to the consumer that insecticide is present and still effective.

### Access to ITMs

- There was a great range in the amount of time consumers would have to travel to find a net. Almost half had good access: they could walk to a place where they could purchase a net in approximately ¼ of an hour. Others, especially in the far rural areas, would have to travel long distances (73 min) by bus to obtain their nets. Fairly large proportions of nets (especially in Thies, St. Louis, and Kaolack) were provided by the public sector. Insecticide treatments for nets are virtually unavailable in the commercial sector. A key challenge will therefore be to make nets and treatments more widely available through the commercial sector, bringing them closer to where people live, with particular attention to far rural areas.
- Many people living in far rural areas as well as in Dakar itself said that nets were not available or that they did not know where they could be obtained. It is key to improve ITM supply and let people know where nets and treatments can be obtained.

### Mosquito net ownership, treatment, and appropriate use

- Net ownership in the study was moderately high, especially in far rural areas and in St. Louis and Tambacounda. Non-owners, especially those in rural areas, said that the main reason they did not own a net was cost. A key challenge to increasing net ownership should be placed on changing the perception of nets as unaffordable, particularly because people are already spending a lot of money on mosquito control products and nets are economical in the long-run. Currently a fairly large proportion of nets is being provided by the public sector (e.g., health services, clinics, and projects), with the result that many people expect the cost of nets to be low. Commercial nets will need to be priced competitively with those distributed through the public sector or they must be seen as being sufficiently more desirable to warrant paying more for them. Possibly commercial nets would be seen as reasonably priced when weighed against the cost of multiple cases of malaria. Ideally, subsidized nets would be targeted to low income groups unable to afford commercial nets.
- Some non-owners, especially those living in or near Dakar, felt that nets were unnecessary. Special attention must be given to countering these perceptions, possibly by emphasizing the benefits of treated nets in killing/repelling mosquitoes and in reducing malaria.
- Because brands of nets were generally unknown and the proportion of tailor-made nets owned is fairly high (19%), commercial players will need to develop and market strong brands of nets that are associated with the characteristics that consumers want.
- The proportion of children under five and pregnant women sleeping under nets in net-owning households was moderate. Promotional and educational efforts are necessary to encourage net use by children under five and pregnant women.
- Given that consumers slept under nets only approximately half of the year, behavior change strategies are needed to encourage year-round net use and address any barriers to doing so.
- The concept of treating nets with insecticide was fairly well known, especially in urban areas. However, net treatment rates were low; few nets were treated after purchase and even fewer were re-treated on a regular

basis. Promotional and communication efforts are needed to raise treatment rates. Such a campaign can build on respondents' positive reaction to the concept of ITMs, particularly emphasizing the effectiveness of net treatment in killing/repelling mosquitoes and other insects — highly valued attributes of mosquito control products that are not currently associated with nets. A long-lasting net would help to overcome the challenge of getting people to re-treat nets, but that as long as untreated nets are used, re-treatment will be necessary.

- Half of nets owned by households and that had been washed were washed at least once a month. Promotional efforts must address how often nets should be treated/re-treated as well as washed in between treatments. Long-lasting treated nets must be able to withstand frequent washing.
- Insecticide treatments for nets were obtained almost exclusively from the public sector. A key challenge will be to increase involvement of the commercial sector in the production and distribution of net treatment. Strong branding of net treatments that have the attributes that consumers desire is encouraged as well.

### **Consumer net preferences**

- Consumer preferences for net features do not match what consumers currently own. Product development should take into consideration consumer preferences for net size (king), shape (round/conical and rectangular) and color (white, dark blue, pink, light blue) to raise sales and enhance strength of brand. (It should be noted that in the qualitative research, some consumers explained that they prefer conical nets because they are easier to hang and were unfamiliar and novel. Other consumers who chose rectangular ones liked them because they were familiar, fit the shape of the bed, and were perceived as letting more air in. If a rectangular net that hangs from a single point could be devised, it would combine two features that consumers like.) However, product modification should be addressed in light of any cost increases they would involve.

## 6.4 OTHER MOSQUITO CONTROL PRODUCTS

### Awareness of mosquito control products and methods

- Awareness of commercial insect control products — other than mosquito nets — was moderately high, and current use of these products and frequency of purchase was fairly common, even in rural areas. The fact that urban and rural dwellers know about and use commercial insect control products is favorable for net and insecticide treatment promotion. In addition, the fact that many consumers currently spend significant money on aerosol sprays is favorable for ITM promotion and sales. Promotional efforts should emphasize the insecticide characteristics of treated nets (e.g. killing mosquitoes and other insects), which are likely to have strong appeal to consumers. In addition, efforts should stress that use of insecticide treated nets is more economical in the long run than use of aerosol sprays.
- Consumers reported that coils and aerosols were mostly bought in general shops. Since nets were purchased mainly in open-air markets and from the public sector, the insect control product market appears to be specialized. Successful sale of ITMs may require that the commercial sector overcome this market specialization.

### Perceptions of mosquito control attributes, products, and brands

- The most highly valued attributes that consumers wanted in an insect control product were that it kills mosquitoes. They also wanted a product that kills other insects, reduces malaria, is safe to use around children, and is a long-lasting solution to mosquito problems. While consumers rated sprays/aerosols higher than any other product on killing mosquitoes and other insects, mosquito nets were rated highest on the other attributes that consumers valued most. The fact that consumers strongly value the key attributes that ITMs deliver and that nets are already associated with many of these attributes is very positive for ITM promotion and sales. ITM promotion activities should highlight the fact that treated nets kill mosquitoes, kill insects other than mosquitoes, are a long-term solution to the mosquito problem, reduce malaria, and are safe to use around children. Branded nets should stress that they are a high-quality and effective brand.

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